

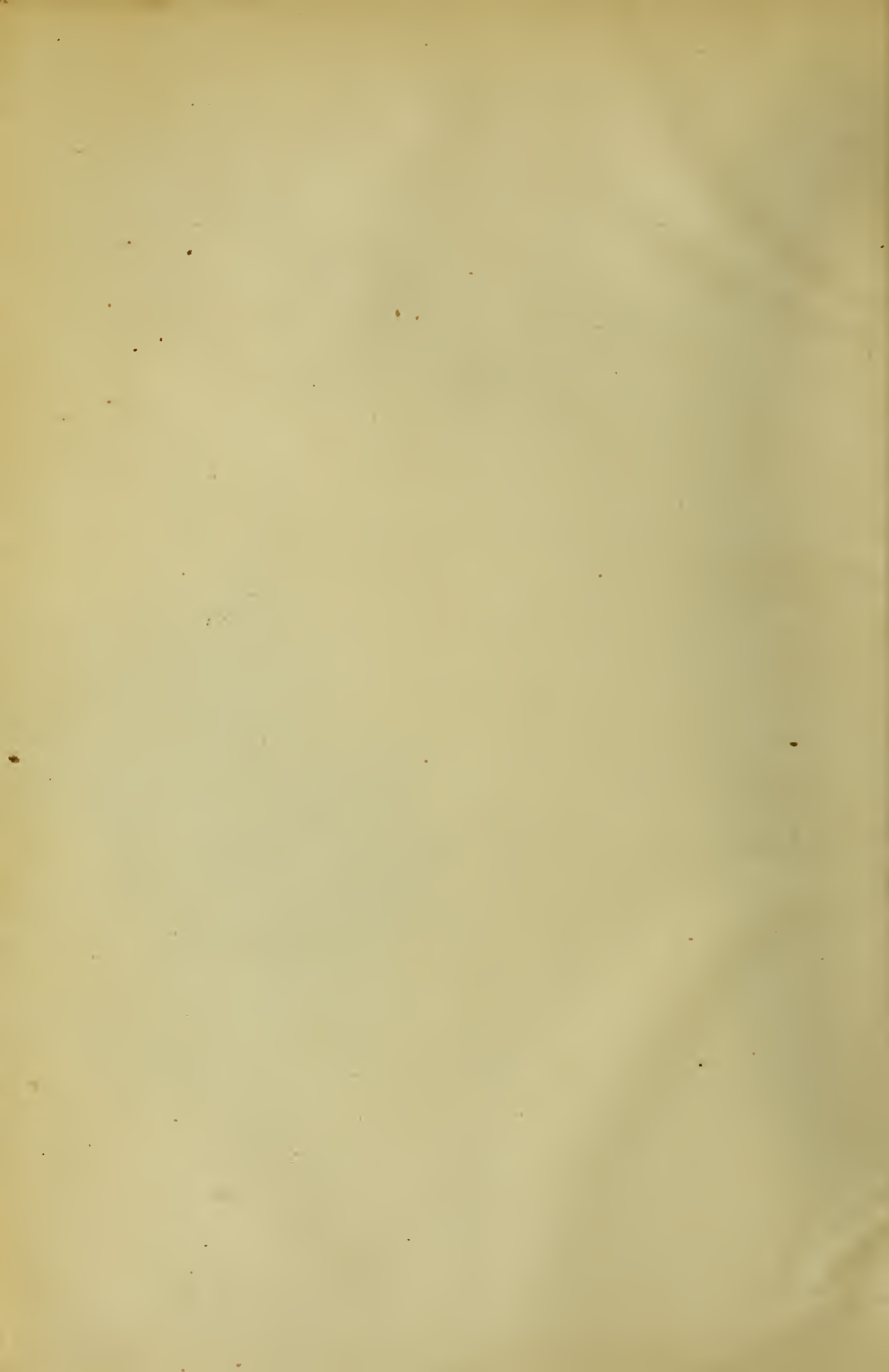
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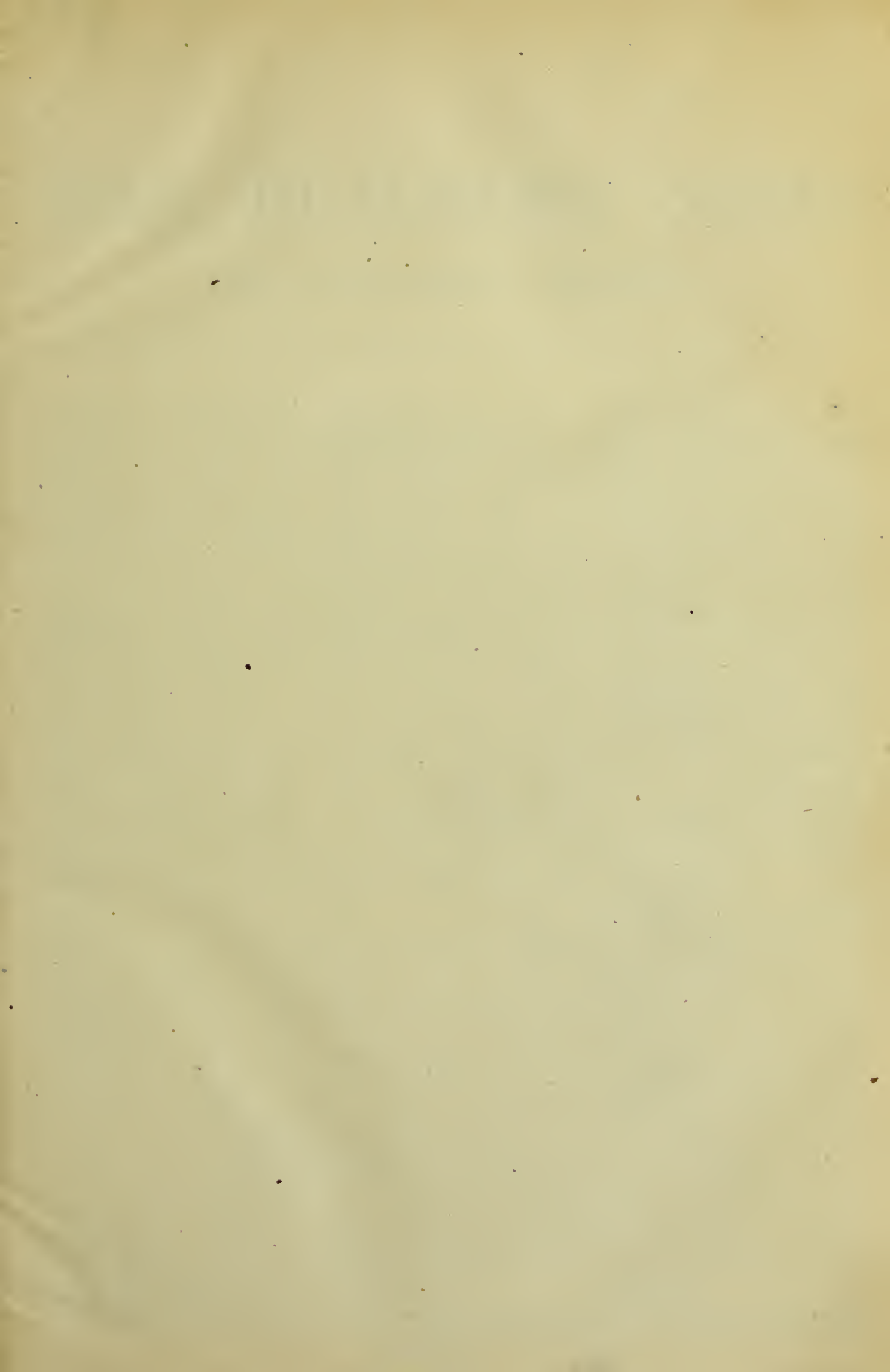
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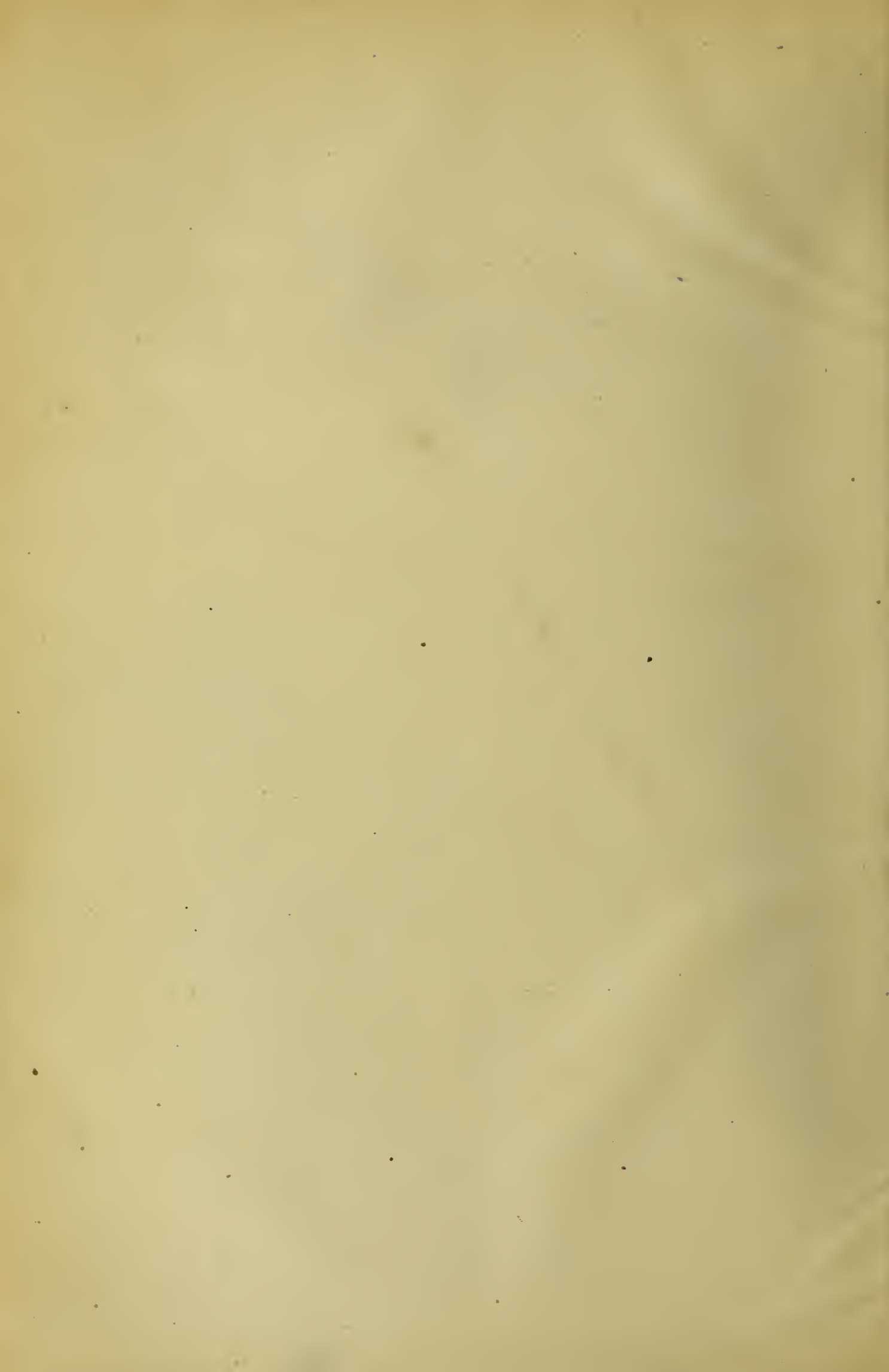
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THE BUILDING NEWS

AND ENGINEERING JOURNAL.

THE INSTITUTE CONVERSAZIONE.

THE dismal aphorism uttered by a late statesman—viz., that life would be tolerable but for its pleasures, does not always find recognition even among the learned societies. We may venture to question whether amid all the theories which have been of late propounded for reform at the Institute in matters of professional practice and education, official management and external policy, a dozen supporters of each or all these schemes would be found to vote for the abolition of the annual *conversazione*. It has become an accepted institution, a traditional holiday in Conduit-street, which gives pleasure not only to a large proportion of the Society's own members, but to their friends, as well as to the members of many another corporate body with which the Institute is, by the natural course of things, occasionally brought into official relation, and who all by common consent flock to the *réunion*, as one of the most sociable and pleasant, if not the largest or most pretentious of similar gatherings of the season.

The space available for this purpose cannot, of course, be compared with the palatial salons of the Royal Academy, or the still wider range of area occasionally given up to the Society of Arts at Kensington; but it must not necessarily be inferred that this is a drawback to the success of the Institute *conversazione*. If the number of invitations issued is limited, the probability is that they are issued with discretion; and though the entertainment has not yet gained the *prestige* which is sure to attract a large proportion of the fashionable world, the Council do not, on the other hand, send their "at home" cards broadcast among the common herd of London sight-seers; and, in short, the company of guests bidden, if not prodigious in number, is tolerably select. We believe that in former years it was the custom to intrust to some picture-dealer the task of lining the walls of the Institute with works of art on these occasions. By this means, no doubt, a very valuable collection of paintings might at any time be displayed; but then it would be nothing more than what might be seen in any other exhibition during the season. Half the interest of the Institute *soirée* depends on the fact that most of the pictures the objects of *virtù* and art-manufacture lent for the occasion either belong to members of the Society or are the result of their professional skill in design; and the rest are, as a rule, the contributions of gentlemen connected with the Institute either by private friendship or professional association.

For example, Mr. J. P. Seddon (Fellow), lent two interesting works, one a study of camels at Cairo, executed by his brother (a gifted artist, whose career was short, but long enough to be well remembered by his fellow-students); the other, a water-colour drawing by D. G. Rossetti, the subject being Giotto painting the portrait of Dante. On Mr.

Seddon's large perspective view of the University College at Aberystwith, it is hardly necessary to comment here, as it formed the subject of an illustration in our last week's number. The casts from sculptured lions executed for one of that gentleman's works by Mr. J. M. Griffith, are small but vigorous examples of the grotesque school.

The President (Mr. Thomas H. Wyatt), exhibited photographs of two cleverly-designed altar-tombs of the Italian Gothic type, and a careful study of the Perugino ceiling in the Sala di Cambio, Perugia, executed by Sir Digby Wyatt. Mr. G. Row Clarke lent some water-colour drawings illustrating the curious old Welsh Church at Dolwyddelan, with its quiet Jacobean fittings and eccentric-looking pulpit (reared within the altar railings!). A view of the south entrance to Tewkesbury Abbey, and of the "Gate of Honour," at Caius College, Cambridge, besides a very interesting old triptych—rude, but genuine in design, and probably of English make—inclosing a group of the Virgin and Child, executed in alabaster. Mr. Harry Oliver, to whom the Institute is annually indebted for some contribution to the *conversazione*, sent a study of the ceiling at Greenwich Hospital, by Sir James Thornhill, and a sketch in oil of a scene from the old French Revolution, by Müller; also the portrait (by Simpson) of an old lady, in the hideous head-dress that prevailed for a while in our great grandmothers' time, but which, nevertheless, attracted some admiration from the great refinement and delicate painting of the features.

On the library table were placed some very fine specimens of ivory carving—the property of Mr. J. Peacock—some of Italian, others of French and German, and a few of Indian workmanship, the former apparently varying in date from the fifteenth to the sixteenth centuries—each and all remarkable in their way for vigorous design or refinement of execution: the "Plague of Serpents," a large and boldly-cut alto-relievo, the "Andromeda," and the "Venus attired by the Graces," a small and beautiful cameo, being apparently the gems of the collection. In the same room were an antique bronze figure of a faun, and a marble bas-relief attributed to Bambaja, lent by Mr. F. P. Cockerell, who also exhibited a design by the late Professor Cockerell for the staircase of an Italian mansion; a portfolio of delicately-pencilled studies of Continental architecture by Mr. H. L. Florence, and a water-colour drawing of the Palais du Franc, Bruges, by Mr. J. Hebb. Japanese art was represented by a block book and scroll belonging to Mr. C. J. Shoppee, and by a host of bronzes, enamelled vases, and other objects of *virtù*, selected from the establishment of Messrs. Farmer & Rogers.

On the walls we noticed an excellent example of that accomplished painter, Mr. E. W. Cooke, R.A.—viz., a view looking across

the Bay of Naples, with Vesuvius in the distance, and the foreground chiefly occupied by one of those picturesque and unmistakably sea-going boats which the artist has not failed to find on every shore in Europe, and knows right well how to delineate. As a pendant to this work, hung a large and tenderly-painted landscape, by H. Moore—rich, but not surcharged, with the glow of sunset, and full of admirable artistic qualities. Mr. A. MacCallum's "Cedars," executed in solid body-colour, might have been mistaken for an oil-painting in its force and breadth of treatment. The same artist's "Nant Frangion," and scene from the Forest of Fontainebleau had conspicuous places in another part of the meeting room, and were much admired. The versatility of Mr. F. Smallfield's talents in the field of pictorial art was indicated by the variety of subjects which he selected for exhibition—viz., a figure-piece, "Monks Leaving a Suppressed Monastery"—a landscape; "Moonlight on the Sea-shore," low in tone, but refined and subtle in its effect; and lastly, a clever though somewhat sketchy study of the "Boys' Dining-room at Charterhouse."

Mr. R. P. Spiers, from the almost inexhaustible store of architectural drawings which his industry and skill have enabled him to complete in various parts of the world, contributed views of the Parthenon, the Temple of Edfou, the Town-hall at Andenuerde, and the Cathedral at Lemberg—all carefully and ably handled.

On one of the screens were hung three charming studies by Roberts—viz., the well-known church of Santa Maria Della Salute, the high altar of the Cathedral at Venice, and a view of the Cathedral at Madrid. For these, together with some French drawings of the last century, the Institute was indebted to the kindness of Mr. E. Clements, a non-member. Mr. T. C. Sorby sent two striking landscapes, by Croft—viz., "Mont Blanc" and "Cascade on a River in Switzerland," as well as a "Sketch for a Cottage Hospital," cleverly tinted by himself. Mr. C. J. Shoppee's Canaletti's, though perhaps a little the worse for age, appeared to be genuine examples of that master, and held their own amidst the surrounding glare of more modern paintings. The same gentleman exhibited several interesting miniature portraits, the best of which were hung near a clever study by Edward Lear, "The Pass of Tyrana in Albania," the property of Mr. R. Nevill.

Among the lady contributors were Mrs. Marrable, whose landscape sketches are well known in Conduit-street; Miss Partridge, who exhibited the portrait of a young lady; and the Misses Swift, whose "Lesbia," "Study of a Colly Dog," and figure group of "Mother and Child," were all very creditable productions.

The Turner drawings, viz.:—"Ulm Cathedral" and "Burley-on-the-Hill," lent by Mr. T. Woolner, A.R.A., were probably early

works of the great landscape painter, and not very remarkable specimens of his hand, except for a certain delicacy of touch by which they might be recognised.

The examples of art manufacture lent for the *conversazione* were more numerous and better selected than has been the case for some years. A glance at the cheffoniers and cabinets produced by Messrs. Gillow was sufficient to show the very remarkable advance which has been made of late years in the department of decorative furniture. The general forms are simpler and the details less monumental than they were when M. Talbert first began to turn his inventive powers in this direction. The painted panels of Mr. E. Tarver's sideboard were excellent in design and execution, and the silvered background to fruit and foliage had a novel and very artistic effect. Equally good in their way were the specimens of "art pottery" from Mr. W. S. Coleman's studio at Kensington Gore. Vases, plates, dishes, plaques, and tiles of various shapes and kinds, chiefly hand-painted, and all produced under the immediate superintendence of Mr. Coleman, were exhibited and minutely inspected by the visitors. This branch of ceramic art is now receiving attention from Messrs. Minton, in addition to their ordinary manufacture, and is certainly superior to anything which has hitherto been produced in this country under the much-abused name of "Majolica." If Mr. Coleman will only take for his models the best types of ancient ware, in choice of colour and character of drawing, and steadfastly resist the temptation towards mere prettiness and false delicacy of finish which may be reckoned the bane of much decorative art in the present day, we may expect great reforms before long in the fashion of English pottery. Of Minton's ordinary majolica, large, showy, and brightly coloured as it is, many examples were lent by Mr. J. Mortlock, and helped, in association with the flowers and shrubs of which there was an abundant supply, to decorate the rooms very effectively. The same may be said of Messrs. Copland's Parian statuettes (many of them modelled with great refinement), garden seats, and flower vases. But perhaps the most interesting specimens of crockery in the room were four or five modern reproductions of Gubbio ware, executed in Italy, and consigned for the present to Salviati and Co. There may, of course, be difference of opinion as to whether it is advisable, in the interests of art, to copy such works at all, but in any case Italy may fairly be congratulated on the possession of craftsmen among whom the traditions of old art linger to such an extent as to make such work as this possible in the nineteenth century. In modelled form, in surface decoration, and in quality of colour these vessels accurately reflect the work and spirit of a bygone age. Salviati's handsome Venetian mirrors, and delicate table glass; Hart and Peard's Mediaeval metal-work (including specimens designed by W. Burges and J. F. Bentley); an altar frontal and super-frontal, embroidered by Messrs. Brangwyn from a design by J. Clarke, F.S.A.; Messrs. Green and King's curtain stuffs; Messrs. Jeffrey's wallpapers, designed by Owen Jones, W. Burges, and C. L. Eastlake; as well as many other objects, deserve a longer notice than we have space to give. It only remains to be added that about 600 members and guests were present; that they were entertained with the music of a capital military band; that the usual refreshments were provided, and that the company, after lingering till half-past 12 o'clock, went away agreeing that they had spent a pleasant evening.

REMEDIES FOR THE POLLUTION OF RIVERS.

SOME new light has been thrown on the pollution of rivers by the refuse liquids from woollen works by the two remaining members of the existing Rivers Pollution

Commission—viz., Dr. Frankland and Mr. John Chalmers Morton, Sir W. Denison having died before the completion of the report—the third of the present Commission, dated 22nd April, 1871—but the two surviving members claim to represent the views Sir W. Denison would have concurred in could he have attached his signature to the present report.

A former Commission, it will be remembered, reported on the Aire and Calder river basins in 1867, the principal seats of the worsted and woollen manufacture in the West Riding of Yorkshire, and the present Commission continued their inquiries into the pollution of the rivers Mersey and Ribble; but finding the instructions which confined their inquiry to those rivers and their basins did not give them scope enough to make a full and final report on the pollution caused by the woollen trades, they asked for further instructions, and they were directed to inquire into the specific pollution caused by any particular manufacture, wherever located, in England or Scotland; and this report deals with the effects of the woollen manufacture on rivers and streams generally, including not only the clothing districts of the West Riding of Yorkshire, but also those of Gloucestershire and Somersetshire, the flannel trade of Wales, the blanket manufactories of Witney and of Dewsbury, the worsted and rug factories of Kendal, and the carpet works of Kidderminster, Halifax, Rochdale, Durham, and Wilton; and that they might properly appreciate the information gathered on this subject by their predecessors, and collect such further evidence as seemed necessary, they have held meetings in the Aire and Calder district also, and examined those rivers for themselves; but we will not again go over the ground covered by our notice of the former report of the Commission.*

Nor will we touch upon the chemical aspect of the report, embracing a great number of analyses of water—polluted and unpolluted,—of sewage, and of the refuse liquids of the woollen manufacture. It will readily be believed that these latter are unfit to be sent into any river in their crude state, and we come at once to the remedies proposed by the Commission; but it will be necessary to premise that in the case of the liquid now discharged into the rivers from the woollen works it consists of three kinds, as regards degree of pollution; and while the water used for two of the processes is wholly unfit to be sent into the rivers, the other, and greater part—that used for washing—would, if kept separate, be admissible, or, at any rate, the greater part of it; and the Commissioners divide this refuse liquid into—1, waste liquid from dye vats; 2, waste liquid from wool scouring and washing; and 3, water which has been used for washing the dyed, scoured, or fulled goods.

These liquids are usually allowed, more or less, to mingle together upon the premises of the manufacturer, and the first step to be taken to remedy river pollutions from this source consists in keeping the very foul portions of these liquids separate from those of comparatively much larger volume, but which possess so slight a polluting character as to render them directly admissible into water-courses without infringing the standards of purity which the Commissioners suggested in their report on the Mersey and Ribble basins, which are as follows:—

- Any liquid containing in suspension more than 3 parts by weight of dry mineral matter, or 1 part by weight of dry organic matter, in 100,000 parts by weight of the liquid.
- Any liquid containing in solution more than 2 parts by weight of organic carbon, or 3 part by weight of organic nitrogen, in 100,000 parts by weight.
- Any liquid which shall exhibit by daylight a distinct colour when a stratum of it one inch deep is placed in a white porcelain or earthenware vessel.
- Any liquid which contains in solution, in

100,000 parts by weight, more than two parts by weight of any metal except calcium, magnesium, potassium, and sodium.

e. Any liquid which in 100,000 parts by weight contains, whether in solution or suspension, in chemical combination or otherwise, more than .05 part by weight of metallic arsenic.

f. Any liquid which, after acidification with sulphuric acid, contains in 100,000 parts by weight more than 1 part by weight of free chlorine.

g. Any liquid which contains in 100,000 parts by weight more than 1 part by weight of sulphur, in the condition either of sulphuretted hydrogen or of a soluble sulphuret.

h. Any liquid possessing an acidity greater than that which is produced by adding 2 parts by weight of real muriatic acid to 1,000 parts by weight of distilled water.

i. Any liquid possessing an alkalinity greater than that produced by adding 1 part by weight of dry caustic soda to 1,000 parts by weight of distilled water.

The Commissioners then give an analysis of each of the three kinds of liquid we have named, from which it appears that the dye-vat liquor is many hundredfold, and the scouring liquor many thousandfold more polluting than the washing liquor, which is far below the standards above given, and could in the opinion of the Commission be discharged into any stream without appreciably fouling it. It must be remembered that the standards above given are for the Mersey and Ribble basins, and therefore for water polluted by the cotton industry chiefly; and in respect of the woollen industry the Commissioners say, "It may be stated as a general proposition that the polluting materials in the woollen trade are diffused through a much smaller proportion of water than is the case in the cotton dyeing and printing trade, where the chief dye-stuff used, madder, requires a very large volume of water for the extraction of the colouring matter which it contains. Consequently it may be inferred that the remedies required for the purification of liquid refuse from the woollen trade will entail less trouble and expense than those which we have recommended for the calico printing industry." And the remedies were, irrigation of land where it is practicable; and where it is not, filtration through porous earth or sand intermittently; but another alternative is now proposed for the woollen districts, viz., evaporation. Under the head of "Treatment of refuse liquids by evaporation," the Commissioners say, "The great concentration and consequent small bulk of the more highly polluted liquids produced in the woollen manufacture, render feasible a method of disposing of them which would be utterly impracticable in the case of more dilute and voluminous foul waters; we allude to their evaporation. Under even moderately favourable circumstances a pound of coal will evaporate a gallon of water, consequently, where the volume of the highly polluting liquids is known, the cost of thus disposing of those liquids is easily ascertained." Nevertheless, while the Commissioners adduce this mode of getting rid of polluting material as one applicable under any, even the most adverse, circumstances, they do not wish to be understood as recommending it to be employed exclusively where either irrigation or intermittent filtration can be carried out.

We will not now go into the question of irrigation, but will make a few remarks on the method of intermittent filtration proposed by the Commissioners as a remedy for the evils complained of. This system was first proposed by the Commissioners in their report on the Mersey and Ribble districts, but their experiments had then been only with town sewage. Sewage, it was ascertained (by experiments in the laboratory), could be purified to the standard laid down by passing it through porous earth, or through sand, intermittently; that is to say, made to pass through a filter of either of those materials for a time—say six or twelve hours—and then through another one for the same time. The sewage sank through the filter bed, and atmospheric air followed it into the pores

* See BUILDING NEWS, Vol. XIX., p. 489, "Yorkshire Rivers."

of the material. When this process had been completed on any particular bed, the filtering materials were ready to receive more sewage, the water of which would pass off again clear as before, the purifying element being the oxygen contained in the air, which, being brought into minute contact with the sewage, oxidised it and made it fit to be discharged into a river. And now the Commissioners have made similar experiments with the refuse liquids of the woollen manufacture. With sewage it was found that a cubic yard of material purified from about 10 to about $4\frac{1}{2}$ gallons in twenty-four hours, according to the kind of material employed. A soil brought from Dursley, in Gloucestershire, was the best, and purified 9.9 gallons per cubic yard in twenty-four hours. Sand purified 4.4 gallons in the same time. Other materials were tried, as sand with pounded chalk, soil from Beddington, from Barking, and from Hambrook.

Now to apply this principle to the purification of sewage we may take about 30 gallons per head of the population per day (exclusive of the rainfall) as the quantity to be dealt with, and if we take for an example a town of 10,000 inhabitants, there would result 300,000 gallons per day. If this were filtered through Dursley soil, 6ft. deep, at the rate of 9.9 gallons per cubic yard, it would require about three acres of surface; and if through sand, at the rate of 4.4 gallons per cubic yard, $6\frac{2}{3}$, or say 7 acres.

The quantity of foul waste liquid from dyeworks is taken at 12,000 gallons for every ton of cloth manufactured per week. The experiments show that this liquid cannot be purified at a rate of more than about 1.5 gallons per day per cubic yard through the best medium.

The actual experiments were made at the rates of .56 gallon, .84 gallon, and 2.8 gallons, and the rate of .84 was found to satisfactorily purify the fouled waste liquid from woollen-works, and the Commissioners say that, judging from their experiments, they render it probable that the purification would continue to be satisfactory if that rate were doubled; so that 1.5 as a maximum would not be far from the mark; but if we take one gallon per day per cubic yard of filtering material, we find that for a woollen-mill, where one ton of cloth is turned out per week, discharging 12,000 gallons of foul liquid in that time, it would require, with Dursley soil, if the filter bed were 6ft. deep, about 1,000 square yards—say 50 by 20; but at least two of these would be necessary, so that they could be worked alternately.

REVIEWS OF RECENT BUILDINGS.

II.—VENETIAN AND ITALIAN GOTHIC.

NOT far from the offices in Lothbury which were the subject of our last week's notice are two other designs in an almost identical style. The first, and best of them, is No. 3, King-street, Cheapside, just completed from the designs of Mr. J. H. Christian. Both its fronts—the one towards King-street and the other towards Ironmonger-lane—are narrow, and completely built up to on each side. The site was by no means a promising one; two narrow strips of elevation are all with which the architect could deal, and he deserves the more credit for the use he has made of them. The building consists of five stories besides the basement. It is of red brick, with stone dressings, and is covered by an ordinary slated Mansard roof. The arrangement of the main features, apart from their detail, has method and interest about it. They have none of that intense regularity which Classic traditions too often impose on our street architecture. With one exception, they are all well placed, and their places are evidently fixed by the internal planning. The design has thus an interest and individuality about it which are much rarer in our town architecture than they

ought to be. Too often, even in Gothic or semi-Gothic buildings, the architect seems to fancy that his doors and windows must be spaced out as evenly as his floor joists; he does not ask where internal convenience requires them; still less does he try to dispose them in a striking and effective order. He takes it for granted that they must all be so many feet from centre to centre, and all just one above another. His one idea of setting out a street front is to divide it into the usual number of bays in width, and the usual number of floors in height, and then put an opening in each bay of each floor. This is the mechanical system of design—if design it can be called; the system which begins with the elevation and works in the internal planning to suit it. So prevalent has it been that an architect may be almost pardoned for forgetting that anything else is possible. It does require something like an effort, in thinking over the possibilities of a London house, to remember that it is permissible to put any general design at all into it. When every front in the neighbourhood has its windows arranged as formally as the squares of a chessboard, it takes something like originality to realise that there is no cause in Nature or facts for this iron regularity; that it has no more utility than beauty; that it is both ugly and unreal,—a mere piece of conventional make-believe which we should all rejoice to see exploded.

The designer of the little building now in question has, at any rate, broken through the tyranny of custom in this respect, and thus given to his work the charm of reality and freshness. In the King-street elevation, the ground floor is occupied by the entrance doorway and a kind of large shop window. The latter is the most unpleasant and discordant feature in the whole composition. It is spanned by a segmental arch, and it is seldom that segmental arches look well amongst circular ones. It has none of the mouldings or ornamental details of the Venetian style, and it is difficult to suppose that its actual form is that originally intended. Shop fronts and similar gaps in the lower part of a façade are, of course, difficult matters to deal with; and the requirements of building owners on such points are sometimes enough to make an architect despair. But whatever may have been the occasion, the large opening here is very unsatisfactory in its effect, and we gladly turn from it to other portions of the design. The entrance doorway has a semicircular head, turned at the crown into a slight and delicate ogee. The arch is stilted, and its tympanum, which is solid, is carried by a moulded lintel running across just above the impost. Over the doorway is a balcony, carried by two well-carved trusses, and having a front and sides of miniature arcading. A moulded stone cornice marks the division between the ground and first floors; and from this point to the attic there are three, instead of two, openings on each story; but on the first floor they are not united in a single range, and still less are they spaced out in the regulation manner of our so-called "Classic" edifices. Two of them, joined by a substantial column, stand centrally over the large opening below; the other, some distance off, comes above the entrance-door, and consequently in the middle of the upper landing. No arrangement, it would seem, can be more natural than this in the multitudes of cases where the entrance occupies one side of a narrow front. The single light, internally, is in the centre of the staircase: the coupled lights come in the centre of the room. And yet, though this disposition of them is the natural and really simple one under the circumstances, nineteen people out of twenty never venture to adopt it. They sacrifice real for sham simplicity. Their first requisite is the equal spacing of the windows; and they are quite ready to misplace them internally if they can only carry out their pet notion of regularity on the outside. The arches of the first-floor windows, like that of

the front door, are semicircular ones, with a slight ogee point; the mouldings and drip-stone follow the same curve, the latter being ornamented with the billet.

The second and third floor windows are in groups of three. The former are tall and well-proportioned, with stilted semicircular arches. The openings, however, are square-headed, and each has thus a tympanum recessed within the circular head, carried by a stone lintel, and filled in with red brick diapers. The dripstones, carved with the billet as usual, have ogee points, and on the wall surface between them are a series of round panels inlaid with coloured marble or granite. Next comes a moulded string, and above this another range of three windows, divided from each other, like those below them, not by columns, but by plain square piers. They are covered by substantial stone lintels, perfectly unadorned in any way, with very satisfactory effect. It is one great merit of this group of Venetian-Gothic buildings, that they show honest square-headed openings, without any pretence of an arch above them. One of the weakest points in our Mediæval street architecture, or at least in the poorer specimens of it, has been the bungling way in which it has dealt with window heads. For the sake of the sashes, its openings have been very frequently made straight or segmental at top; but, to look at them, one might suppose that a straight lintel or a segmental arch could hardly be made to carry its own weight. Whichever has been adopted, the next thing has almost always been to put a pointed arch above it, or sometimes a round and a pointed one as well, and the consequent appearance is that the architect failed to do his work properly in the first place, and was thus compelled to do it over again subsequently. In point of fact, as we all know, the cause is very different. The pointed arch was not inserted because the architect did not know how to support his wall without it, but because he did not know how to make his design Gothic without it; and therefore, after having done all that construction required, he put in another needless piece of construction for the sake of its effect. Those who have been thus accustomed to put arch over arch, and arch over lintel, to do their work badly at two or three attempts instead of doing it thoroughly at once, would be wise to examine the plain square-headed openings in this design, and in the Lothbury one we reviewed last week. The result, we think, should be to make this unpleasant piece of architectural affectation rather scarcer than it is. This King-street building, as we have stated, exhibits one instance of such double construction, though by no means an offensive one. Even this we would gladly have dispensed with, for the practice has been so abused that one regrets to see in good work anything that may seem to give it support. The progress of architecture ought to be constantly eliminating all such imperfect pieces of design as this, to be gaining refinement by adopting more and more direct methods for what it has to do. Roundabout and laboured expedients such as this show the hand of the tyro, not that of the master.

The elevation is crowned by a projecting eaves-cornice, a flat slab worked on the edge with dogtooth, and carried by moulded corbels. But this, happily, is not the finish of the building. In Mr. Somers Clarke's design we had to speak of the painful absence of any consideration for the skyline, of a roof too flat in pitch to be visible, and of chimneys so shaped that we could well wish them invisible too. Here we have not only a steep roof, but a stone-fronted dormer window of two lights, adding considerably to the effect of the work. This is one step in the right direction, and it is hard to see why we cannot take another. We know of nothing to prevent the use of the old English gable end even in conjunction with Venetian details, or at least with closely-allied ones. But, however this

may be, it seems unquestionable that in their general features, Northern rather than Southern Mediæval buildings are what we should follow. We have the same climate in England which our forefathers had; whatever character in their works was produced by climate, we shall therefore be wise to retain. But we have not the same social or political circumstances, and here we may look elsewhere for models. Our middle-age remains are chiefly in rural districts; we can learn little from them about dealing with City architecture, and we may learn much from a Mediæval city like Venice. Its examples, as might naturally be expected, adapt themselves with ease to many of the requirements of a modern town; but, as equally might be anticipated, they fail in the special qualities wanted to suit a Northern climate. If we are wise, we shall take suggestions from them in the one department and not in the other. There is no law forcing us to adopt the Venetian style bodily or to leave it alone; we can keep what we want and leave the rest. Its fenestration seems worth taking, or at least worth studying; its flatness and squareness and over delicacy of detail are far better done without. In the skyline, which is so important a part of a town building, we shall find far better examples native to our soil; and we are glad to see their influence even in works of almost purely foreign detail, like the present one. It does not go far, it is true, in the direction of picturesqueness, but as far, perhaps, as could be expected in so small a building. There is some definite shape and character about its topmost story, and so far it is in advance of the more important design previously referred to.

The elevation next Ironmonger-lane is very similar in detail to the King-street one. Its windows, indeed, are arranged on a different scheme; but their position is regulated by the same principle. The internal planning still governs the elevation, and the architect has not started with a mechanically uniform exterior, and then twisted all his rooms and passages about to fit it. Thus, the story next below the eaves-cornice has a range of four lights, divided by piers, which occupy the greater part of the width. The floor below, on the contrary, has only two windows, not coupled, but separated by a wide space of brickwork, as is natural when the frontage is divided into two apartments by a partition in its centre. The next story, going downwards, has an arcade of three lights—round-headed, with ogce dripstones—their arches coming down on the foliated capitals of two substantial columns. The ground floor, in the back of the building as in its front, is the least pleasing of all in its treatment. Here it was evidently a desideratum to obtain the largest possible quantity of window space, and the glass extends to within a foot or two of the angles of the building. The whole elevation, in fact, rests on four stone piers, one at each side and two between. These piers have moulded caps, from which spring stone brackets or cantilevers, spreading out laterally to take the iron girder which carries the wall above. The brackets are plainly unnecessary, and would, we think, have been better omitted. To have substituted round arches for them would scarcely have made the smallest difference as regards light, while the architectural improvement would have been immense. In this elevation, as well as the front one, a range of square-headed basement windows appears above the pavement; and the iron bars which protect them, though of the simplest character, are well designed for their purpose. The woodwork of the front door also deserves notice. Throughout the design may be traced, in some measure, the usual fault of Venetian detail as applied to English circumstances; a tendency in the mouldings to be so small and delicate that dirt will soon obscure them, and that every cloudy day will rob them of half their effect. Some of them, especially the strings and cornices, with their slight, almost shadowless,

bell mouldings, are evidently adapted for direct sunshine, and not for the diffused light which prevails here six days out of seven. The carving, too, perhaps from the same cause, is too small and too complex to be well distinguished, which, as regards the bulk of it, is no great loss; but the treatment of the windows, and the reality and naturalness with which they are arranged, are points which deserve considerable praise. With the exceptions already pointed out, they are well proportioned, well constructed, and well placed; and none of these qualities, unfortunately, are very common in modern English work. The proportions of our windows are, as a rule, abominably squat and dumpy. Those yawning chasms which were first adopted in order to evade the window-tax, are still regarded by the public in general as the only proper means of lighting their dwellings. Years ago, there was a strong economical reason for reducing all apertures to a few wide holes in the wall, and the practice has taken root, though the reason has passed away. When we notice a fine old manor or farmhouse, with half its lights bricked up, we may well anathematise the policy which ruined some of our ancient architecture. But when we see front after front of a modern street disfigured by gashes which nothing but the force of habit could render tolerable, we may remember that this, too, is another and more lasting result of the same deplorable cause; and we should welcome, even at this late period, every symptom of a reaction against its disastrous results.

There is another building in King-street, No. 29, on the opposite side of the way, to which no such commendation can be accorded. If the lavish use of billet mouldings is enough to make a design Venetian-Gothic, then this one must unquestionably be in that style. With a frontage only some twelve feet across, it has nearly enough of this particular ornament to reach from Guildhall to Cheapside. It is five stories in height above the ground, and each story is marked off from the rest by either one or two strings of billet moulding. There is a vertical line of billet moulding close to each angle of the wall, to separate the front from the adjoining ones; and another vertical line on each side a short distance within the first one, making altogether four upright strings of this ornament, besides seven horizontal ones. In each of the spaces thus framed off, except the lowest one, is a very wide and very short square-headed window, with the least possible amount of reveal, and with a small roll running round its top and sides by way of architrave. On the first and second floors this roll has a little cap and base worked on it in Late Gothic fashion, while in the one case it is twisted or cabled above this cap, and in the other below it. The ground story has, perforce, a window of less displeasing shape than the rest, since, as the entrance doorway is taken off by its side, the width is not sufficient to allow it a full share of deformity. By way of decoration there are some rows of raised panels under the sills, worked with simple, though scarcely beautiful combinations of circles and crosses. The whole front is of ashlar, and ends at top in a cornice carried by moulded corbels. Its lowest story is by far the best one, but the design throughout has little to recommend it. It is thin and flat to the last degree, and we have noticed it chiefly as showing how, of two buildings, both purporting to be in the same style, one may present much to be imitated, and the other little but what it is wiser to avoid.

Of the mixed style of Italian-Gothic or Italian-Romanesque which has been adopted in some other cases, we have left but little room to speak. The Crown Life Office in Fleet-street, by Sir John Deane & Son, naturally suggests itself for comparison with such works as those previously considered. But this, though it also has strong traces of Venetian influence, differs from them widely, and on the whole not favourably. In the

lower parts of its façade the windows are wide and somewhat coarse in design: in the upper part their width is concealed by useless arcades. As a matter of fact, the top windows are wide, short sashes—apparently square-headed, as in the worst type of the “vernacular.” But as these would not look very Mediæval, or indeed very architectural in any way on the outside, there is a shaft put in front of each one, supporting two arches of an arcade. The wide light thus looks, at the first glance, like two narrow ones, though a moment corrects the impression, and shows that the arcading is a mere piece of scenery to hide the construction. Now if this is not a sham, it is a very crude and unsatisfactory idea. It disguises, instead of displaying the actual facts; and we could hardly blame the “practical man” who should knock out the shaft which seems put in for the mere purpose of obstructing his view. These windows, in short, are just of the kind that we should be well rid of; they are modern sash windows, not made artistic, as they ought to be, but clumsily kept out of sight behind a piece of Gothic detail. The misapplied arcading of the upper story is equalled by the misapplied tracery of the next one; and the only instances of simple and truthful design, as far as the lighting goes, are the ground and first floor windows. These, as we have already said, are too wide to be pleasing. The carving has some interest about it, and much of it is executed in Sicilian marble, a material which seems to stand our climate and resist our smoke.

STEAM BOILER EXPLOSIONS.

THE Select Committee appointed to inquire into the cause of steam boiler explosions, and who were subsequently empowered to inquire as to the best means of preventing them, have considered the matter to them referred, and have recommended that it be distinctly laid down by statute that the steam user is responsible for the efficiency of his boilers and machinery, and for employing competent men to work them; that in the event of explosion, the onus of proof of efficiency should rest on the steam user; that in order to raise *prima facie* proof, it shall be sufficient to show that the boiler was at the time of the explosion under the management of the owner or user, or his servant, and such *prima facie* proof shall only be rebutted by proof that the accident arose from some cause beyond the control of such owner or user; and that it shall be no defence in an action by a servant against such owner or user, being his master, that the damage arose from the negligence of a fellow-servant; that whenever an explosion happens to a boiler, whether such explosion is or is not attended with loss of life or injury to person or damage to property, it shall be the duty of the user to report the same to the coroner of the district, and the coroner to whom the accident is reported, or, in the failure of such report, on the fact coming to his knowledge, shall hold an inquiry, and apply to the Board of Trade, and the Board of Trade shall thereupon direct one of their competent practical surveyors of boilers or some other practical person, to assist the coroner in the investigation; and the coroner shall report the result of each investigation to the Secretary of State for the Home Department; and that such reports be annually presented to Parliament.

THE CONSERVATIVE LAND SOCIETY.—At the 75th quarterly meeting of the shareholders, held at the offices, Norfolk-street, Strand, on the 4th inst. (Viscount Ranelagh in the chair), the report of the Executive Committee was presented and adopted. It states that the receipts for the three quarters ending at Midsummer were £96,170 10s. 5d., and the grand totals at the same date £1,679,530 5s. 7d., the withdrawals £431,527 18s. 8d., and the reserve fund stands at £10,500. The last share-number issued on the 24th of June was 36,033, which, at £50 per share, represents a subscribed capital of £1,806,650. Amongst the directors and members present were Viscount Ranelagh (Chairman), Col. B. Knox, Hon. and Rev. W. Talbot, Hon. R. Bourke, M.P., Col. Jervis, M.P., T. K. Holmes, Esq., J. Goodson, Esq., C. E. Newcomen, Esq., N. W. J. Strode, Esq., N. Winstanley, Esq., W. Lowther, Esq., M.P., C. L. Gruneisen, Esq. (Secretary), John Ashdown, Esq., J. Hugh Thomson, Esq., &c.

ARCHITECTURAL ASSOCIATION.

THE closing ordinary general meeting of this Association for the present session took place on Friday evening last, the President, Mr. T. H. Watson, in the chair. The minutes of the last meeting having been read and confirmed, Messrs. Charles R. Piuik, Septimus W. Watson, A. E. Warner, and G. Natrass, were unanimously elected as members, and Mr. John Smith, of Swinton-street, Gray's Inn-road, was nominated for election at the first meeting of the Association for the session 1871-72, which will probably be on the last Friday in October or the first Friday in November. The

ELECTION OF OFFICE-BEARERS FOR 1871-72

was then proceeded with. On the motion of Mr. J. S. Quilter, seconded by Mr. Gilbert R. Redgrave, Messrs. W. J. Ebbetts and G. B. Hart were appointed scrutineers to examine the voting-papers. While they were making their scrutiny, Mr. G. Aitchison, B.A., read a valuable paper "On the Strength of Materials," which will be found below. Having returned to the room, the scrutineers declared the result of the election to be as follows:—

President.—Mr. Rowland Plunbe, F.R.I.B.A.

Vice-Presidents.—Messrs. J. Douglass Mathews and G. H. Birch.

Committee.—Messrs. T. H. Watson, C. Aldridge, G. R. Redgrave, R. P. Spiers, J. T. Perry, H. L. Florence, T. Battenbury, F. W. Tasker, G. W. Rhodes, and W. Penstone.

Treasurer.—Mr. J. Douglass Mathews.

Honorary Solicitor.—Mr. F. Truefitt.

Librarian.—Mr. H. C. Boyes.

Assistant Librarians.—Messrs. E. Flint and R. E. Pownall.

Auditors.—Messrs. E. D. Drury and S. Salter.

Secretaries.—Messrs. John S. Quilter and Bowes A. Paice.

The CHAIRMAN having called attention to the annual dinner of the Association, which is to take place to-morrow (Saturday) at Sidcup (see advertisement in this number of the BUILDING NEWS),

Mr. GEORGE AITCHISON, B.A., then read the following paper—

ON THE STRENGTH OF MATERIALS.

Last year, when the subject of the Architectural Examination was being discussed, I stated that I thought the first necessary for an architect was to be able to build soundly, and this, which I thought a truism, was impugned, and many other things were considered by as many architects as the first necessities.

Shortly after this I was going over a London house with M. Robert Fleury, the French artist, who after passing some slight encomiums on the house, kept repeating "It is a very solid house." I looked rather surprised when he said, "What I say may surprise you; but though it is an excellent thing to have a house well arranged, elegantly designed, and beautifully decorated, the most essential thing for me is that it does not fall on my head." In a large city like London, where space is valuable and light is scarce, every device is sought to diminish the size of the supports, and we find every now and then that buildings do tumble down in the course of erection. That these deplorable accidents may not happen, it is not only necessary to know the science of construction, but also to be acquainted with the exact properties of the materials with which we build. In one of Professor Huxley's "Lay Sermons" ("A Liberal Education, and Where to Find it") he points out how at every step we are educated by Nature, and also the manner of that education. He says, "Nature's discipline is not even a word and a blow, and the blow first; but the blow without the word. It is left you to find out why your ears are boxed." When we are children, and we are getting instruction from Nature in the art of balancing ourselves, our want of knowledge of the laws of statics and mechanics is punished by a tumble that hurts us; but when our buildings tumble down the injury is often ruin to ourselves and others, and we ought as much as possible to avoid the risk of any such terrible catastrophe.

Construction is a science; that is to say, many of the general laws of stability have been discovered, and by making ourselves acquainted with these laws we can insure a success that before was only given to the most brilliant constructors. Shakespeare says, "There was a time that when the brains were out the man would die;" that is not the case now, but we can in many instances provide ourselves with a knowledge of the laws of stability, and do almost as well as if we had brains. Before proceeding with my subject, I may quote a saying of the late Mr. James Walker, that no building ever failed for want of science, but only from want of care in the selection of the

materials, and of the care with which they were put together; and although this is perhaps an exaggeration, yet as we allow for imperfection of materials and workmanship a margin ranging from 1,000 to 400 per cent., extreme vigilance and accurate knowledge will very frequently prevent accidents. Young men, especially, are too apt to consider that the constructive part of architecture is not worth their attention, and not only lose many opportunities of getting valuable experience, but also lose those inestimable habits of thought, of observation, and reflection that a greater attention to construction would give them.

It is impossible to treat of so vast a subject in any but the most superficial way; but if I can impress on you the absolute importance of attention to this subject, and give you some few hints, the time spent in listening to this paper will not be wasted.

Foundations.—I will begin with the soil on which our buildings are built, for as Sir H. Wotton happily expresses it, "If the foundations dance, it will mar the mirth of the whole house." The foundation on which you may build without much thought is solid rock—rock with horizontal strata—or chalk. Those with which some care must be taken are sand, clay, marl, gravel, or ballast. The foundations on which you should not build if you can avoid them are mud, silt, made-ground, slate-shale, loose decomposed rock; and those on which you cannot build are soft mud, bog, running sand, loose peat, soft vegetable mould. In the case of large platforms of solid rock, although it may be well to ascertain what will crush it, yet if the surrounding mass prevents escape, even if it does crush, your building cannot generally come to much harm, provided the rock is homogeneous; but should it be composed of a conglomerate of materials of unequal hardness, the crushed parts may leave up points and split your walls. Sand must be retained in its place and kept dry, or it may get blown away, or may sink by wet getting at it. You know that if you ram a popgun with dry sand, it will shrink on the addition of water; but with these precautions we cannot call sand a bad foundation, as the Pyramids are said to be built on it. Clay is a good foundation, if it be homogeneous and very stiff, protected from heat and from water; but it is perhaps the most treacherous of all moderately good foundations; it shrinks and cracks when exposed for long to a hot dry air. During the late hot summers, many of the houses round London have settled so much as to require underpinning, or pulling down. I have heard of serious settlements occurring by the roots of trees absorbing the water from the clay. On the sides of hills clay often slips. Deep sewers, wells, or cuttings will often tap the water veins and cause settlements, and water getting at it will make it so soft as to be squeezed up all round the walls and piers. Gravel or ballast forms an excellent foundation, where it is thick and in large platforms; the two great dangers are, that it is a superficial stratum with holes or soft stuff beneath, or running water gets to it and washes out the sand. In the bad soils it is well to go down to some solid stratum if possible, and in those on which you cannot build you must either sink pits and pump out the water and loose stuff, and put in concrete, pile, or use cylinders of brick or iron.

Having got so far, the question next arises, How much weight can be put on a given foundation? I suppose that you have ascertained by boring the thickness of the stratum on which you build, and the nature and thickness of those below it. In default of the actual experience of the weight that the stratum you have to build on will carry, the best expedient I know of is the one recommended by Rondelet; to put up a pile engine, and drive the monkey or a dolly into the ground by repeated blows. Suppose your dolly to be a foot square, and the momentum of your monkey when striking twenty tons, you see how many feet or inches the dolly sinks into the ground in a given number of blows; and that will enable you to calculate approximately what weight you can afford to put on, and what sinking you can afford to allow. If your building will not admit of this expense, you can drop an iron bar into your ground from a given height, and calculate it in the same manner as before; or you may roughly take the number of square inches in your foot-sole, stand on one leg, and observe the amount of sinking, and as you know or can ascertain your weight this may give you some sort of guidance. Mr. Barlow stated that two tons to the foot superficial was carried by the London clay without appreciable settlement in the foundations of the Midland Railway Station. Mr. Hawkshaw stated that he put eight tons on the foot on the London clay in the piers of the Cannon-street bridge on the Thames; and though I cannot find any calculation, my impression is that the S.

Katharine's dock warehouses give a pressure of three tons to the foot on the clay or gravel when empty, and five tons when full of goods, which weight per foot is put on the different soils. The most valuable data are got by the combination of many hands, and if those of you who are engaged in offices or on your own buildings, would take the trouble of calculating the weight per foot that is put on the soil, and its nature, no more valuable addition to our knowledge could be made; it would be invaluable to yourselves, and only take a little time and patience.

Concrete.—The main artificial foundation used in London is concrete. It is needless to say that this is only a cheap substitute for brick or stone work, the ground eventually bearing the weight. We are very careless in the matter as compared with our French brethren. As you know, ballast or gravel that satisfies us or the clerk of the works by its look is roughly mixed by labourers in the nominal proportion of six of ballast to one of lime or Portland cement. If our buildings stand, few of us take much trouble to ascertain what weight they will bear, and the wildest notions often exist on the subject. The great bearing power of concrete is often due to its being confined by the adjacent hard earth, and if it were mostly surrounded by loose or soft wet stuff it would fail. The greatest care should be used in getting clean well-washed ballast or clean gravel, free from clay, but the red sand and gravel, when not clayey, causes the concrete to become very hard, in consequence of the iron in it. Ground lime is the best, when it can be relied on to be good well-burnt lime, used fresh, but many of the smaller sellers of lime send out as ground lime either sweepings, or ground lime that has been kept so long as to be absolutely worthless, and it is always necessary to have some from each bag slaked, to see that it is fresh. Stone lime is absolutely useless for concrete where there is running water, as the lime is rapidly dissolved and the ballast only left; and dirty water will sometimes prevent the concrete from setting at all. Blue lias lime or Portland cement should always be used in wet foundations.

To show how fallacious is the usual belief of the strength of concrete, I had a piece quarried out of the foundation of a building that was pulled down. The concrete was lime concrete of six of ballast to one of stone lime, and had been in the foundation for about three years. One foot of it weighed 152lb.; it split with a weight of 21 cwt. on the foot, and crushed to powder with 42cwt. to the foot super. This was no, doubt, very bad concrete, but it was put in by a first-rate London builder, under a clerk of the works. I had some experiments made on the concrete used in a wharf wall, built of one of Portland cement to six of ballast. The concrete weighed roughly about 140lb. per foot cube, had been set about two months, and exposed to the air. The three specimens bore 26, 17, and 24 tons respectively, and some years afterwards it was found impossible to remove any part of the concrete except by means of wedges.

In using Portland cement a rough test of its goodness (provided it be obtained of a respectable maker) may be obtained by its weight, which should be 1 cwt. to the striked bushel. The ballast should be clean, the whole well mixed together, and only sufficiently wetted with clean water to make it into a paste; and if thrown into water it should be allowed to stand for some hours before it is used, and then lowered in boxes.

Mortar and Cement.—I had occasion to make some experiments on mortar composed of chalk lime and green pit sand, and I think the results are sufficiently important to call your attention to them. Mortar composed of—

1 of lime to 2 of sand bore (per sq. in.)	63lb.
1 " 3 "	106
1 " 4 "	106
1 " 5 "	51
1 " 6 "	34

These had been set for about 140 days, or twenty weeks, were mostly in 1in. cubes, and the weight indicated showed when the first symptoms of cracking began, but the difference between the cracking and crushing weight was trifling. Each weight given is the average of about six experiments, so that you see that if mortar is too "fat" it will bear but about half the weight of mortar mixed in the proper proportion, and if too "short," from one-half to one-third. I had only enough to try two experiments for tension of mortar of one of lime to three of sand, and one broke from a flaw before any weight could be applied, and one bore only 22lb. to 1in. They had been set for about fifteen weeks. Now Rondelet gives a weight of 400lb. to the square inch for mortar of three of river sand to

two of lime, set for eighteen months; and Professor Rankine gives 50lb. as the tensile strength per inch of mortar. It may be well here to draw your attention to the fact that mortar sets very gradually, and that the greater part of the failures in buildings results from piers being loaded by the superincumbent weight while the work is still green, or what is worse in warehouses by the building being run up rapidly and the floors loaded months before the interior mortar has had time to set. Whenever rapidity of building is required the piers at least should be built in Portland cement. Mr. Grant found that a square inch of Portland cement bore in tension, after one week—

1 of Portland cement to	1 of sand,	97 lb.
1	2	52.5
1	3	27

Thus, you see, in comparing the tensile strength, that 3 of sand to 1 of Portland cement is stronger in one week than mortar of 3 of sand to 1 of lime in fifteen weeks.

I will only mention one point about Roman cement, for no one would use it in London where Portland cement can be got, on account of the great care required to be used in its manipulation. An idle labourer will mix more than his bricklayer wants, and keep chopping it up or give it too much sand, and it will be of no more use than so much mud or dirt. But where river walls have to be pointed or drains constructed through which water is rapidly flowing, the quick setting of Roman cement makes it invaluable for the purpose.

Bricks and Brickwork.—Of these there are an immense variety in England, and all varieties have some distinctive or useful quality. They are known as the "stock," the "place," the "Staffordshire," or black brick, the "maln" (divided into first and second quality), "cutters" and "paviours," the white, red, and black brick, the compressed and the perforated brick, commonly known as "Pearl's," or "Burham" bricks. The black or Staffordshire brick is useful for paving, for making angles of gateways, or of piers subjected to blows from carts or rough usage, and for the building of piers where space is required, as they will resist immense pressure. The coloured brick is mostly used for facing, the cutters and paviours for paving and groin points or arches; but "stock" and "place" bricks are the principal bricks you will have to deal with, and little is to be said about "place" bricks, as no architect uses them if he can help it, they being the "stocks" that are not thoroughly burnt, being outside the clamp. They are frequently spoiled by rain, have bad ends and edges, and are mostly reddish, soft, and porous. The London gray "stock" is the perfection of a brick for ordinary building. From "breeze" being mixed with the clay these bricks get thoroughly burnt, through supplying the fuel to bake themselves in their own composition. The best are of a yellowish gray, have a fine texture, are heavy, ring well, do not easily break, and are free from stones. Those that are very dark are apt to be twisted and heavy, and being half-vitrified are very brittle. Having seen that the bricks are good, that the mortar has been duly made of good materials, and thoroughly mixed in the right proportions (and if you can afford it it is best mixed by a pug mill or rolling pans; if mixed by hand you should scrape down a piece of the mass with a spade, to see that there are no lumps or streaks of pure sand or lime), the next process is to see that the bricks are properly laid, with the proper bond; the men being apt to crop their headers, and thus leave vertical joints in their work, and if work is faced with more expensive bricks the builder himself usually encourages this wretched workmanship. To make excellent work each brick should be wetted, but this can rarely be afforded. The mortar should not be too stiff, but sufficiently liquid to run between the joints, the object being to have a perfectly solid wall, every space between the bricks being filled up solid with mortar, the great fault of London brickwork being that the cross joints are left unfilled for half their depth,—a wet brick, a thin joint, and all the cross joints filled in being the perfection of brick work, but the labour is so great to attain this, that a perfect bit of brickwork is rarely to be found, the nearest approximation being when the work is well grouted with thin mortar every foot in height.

I had experiments made on 9in. of brickwork, set in Portland cement, 6 of stocks, and 6 of malm paviours, with the following results:—The crack weight per foot superficial of the stocks was 31 tons, that of the malm paviours being 25.2 tons, and the crushing weight was about two and a half times the cracking weight; but though these bricks were picked and set by a careful bricklayer for the experiment, one specimen was only one-third of the average strength in the stocks, and two-fifths in the malm paviours,

therefore, when you allow for the imperfection of materials and workmanship in ordinary work, from five to seven tons is the utmost that can be allowed as the bearing weight of brickwork. In almost every case I have seen of the failure of brickwork, it has been through the badness of the foundation or from the work being overloaded while green, or from gross imperfection of workmanship, except in the cases of "buckling," or falling outwards.

Masonry.—In London almost all the stone work is ashlar, except in the case of window and door-jambes, columns, or small main piers, and in those cases in which stone is used in the shape of stone landings, balconies, and cornices. As finer joints and more perfect workmanship are required in stone work, the excellence of the foundation is of even more importance; and where the ashlar is very thin, regular bonding courses should be used to carry the weight of the thin superficial face work, and great care must be taken with the workmanship of backing to prevent unequal settlement of the outer and inner faces. Where it can be afforded, the brickwork should be built in cement. In piers and columns all joints should have a piece of lead over the whole surface some $\frac{1}{2}$ in. from the face, so that all unequal settlement may be counteracted by the squeezing of the lead, and the joints should be pointed after the whole building is complete. It is so much easier for a mason to get his stones laid by setting them on a thin edge and running them than any other way that without the greatest care is taken he is sure to do so, and then, if much weight comes on, the outer face is split or "spalled," as in the granite columns of the Holborn Viaduct; or if the stone be laid on brickwork the outer face of the brickwork is split, very often causing serious alarm, if it does nothing worse.

No one should use stone, unless it is from a well-known quarry, without having at least half a dozen cubes crushed to test its power of resistance, and from one-tenth to one-quarter only of its crushing weight should be given for its utmost load. The tensile strain of stone is as a rule still unknown, and it is almost as surprising that manufacturers do not give the cracking weight, tensile strength, and cross strength of the stones they supply, as that architects should so long have been contented to solve their most difficult problems by guesswork. I could hardly have believed that the tensile strain of granite was still unknown until I had to make inquiries for some granite cornices, and I was then obliged to forego their use and substitute iron, as the work would not stand the cost of experiment. We are not to blame the Medieval architects, who had none of our appliances for testing, that they trusted to experience, observation, and daring alone, for their pendative constructions; but if we want to imitate their bold use of the tensile strength of stone we may as well ascertain what we have to trust to.

Woodwork.—As fir is almost exclusively used for construction except in the few cases when oak story posts are used, I shall confine my few remarks to fir. Dry fir weighs usually about 32lb. to the foot cube, but a piece cut off a balk just floated up will weigh as much as from 45lb. to 48lb. The utmost weight it will bear on the grain to crush it is about 2 tons to the inch and about $1\frac{1}{2}$ tons to crack it, while at right angles to the grain it will bear but little more than 8 cwt. to crush it per square inch, and about 6 cwt. to crack it. Its tensile strain is from 3 tons to 6 tons in the direction of its fibres, but only about 5 cwt. across them, and about 4 cwt. in cross strain. By this you will see how very much smaller a piece is required when in tension than when in compression, and from its great incapacity to resist pressure at right angles to its fibre how very disastrous it is to place many posts or girders or joists one above another, on account of the compression of the piece between. Choose clean moderately fine-grained timber, with plenty of turpentine in it, without large or dead knots. Take care that the ends lie on lead, if possible, or some other material that does not absorb moisture nor rapidly condense it, and always have free ventilation round the ends of your timbers. I may here remark that rounded joints take off two-thirds of the strength of the timber, although that form is much affected by old clerks of the works and builders. Not more than one-tenth of its breaking weight should be put on timber, and in calculating its strength take the solid part only when there are mortices or notches. I will only add that it is sometimes sought to strengthen timber by iron plates, commonly called sandwich girders, or by iron ties; but as these two materials don't work together, a little stiffness and little or no strength is gained by this proceeding. I had some girders experimented on for the purpose of ascertaining this. The girders were two balks, 13in. square, bolted together, with a clear bearing of 16ft., loaded in the middle. This broke with 43 tons

and a deflection of 2in. Another of the same scantling was tried with a sandwich plate $\frac{1}{2}$ in. thick between. The iron broke with 30 tons and a deflection of one inch and nine-sixteenths, and the timbers afterwards with 40 tons and two inches and five-eighths deflection. In the second experiment, as before, the iron broke with 45 tons and $1\frac{1}{2}$ in. deflection, and the timbers at 50 tons, with one inch and eleven-sixteenths deflection. Similar timbers were trussed with two $1\frac{1}{2}$ in. tie-rods, and one timber broke with 35 tons and two inches and three-eighths deflection. A piece of timber 12 $\frac{1}{2}$ in. square was broken, with a clear bearing of 8ft. 6in., the weight applied in the centre. It bore 35 tons, with a deflection of two inches and five-eighths. Another piece, 14in. deep and 14 $\frac{1}{2}$ in. wide, was sawn down and trussed with a fir trussing, with oak posts and abutments bolted through, and the ends secured together with iron bars three inches by five-eighths of an inch. This broke with 35 tons and a deflection of five-eighths of an inch.

Ironwork.—Cast iron weighs about 450lb. per cubic foot, or 37 $\frac{1}{2}$ lb. per foot superficial one inch thick. The tensile strength of cast iron is from 7 tons to 7 $\frac{1}{2}$ tons, and its compressive strength from 36 tons to 65 tons, or the average ratio of its compressive to its tensile strength is as 1 to 6.5, and therefore the ratio of the lower to the upper flange of cast iron girders should be in this proportion. In castings generally, the parts should be arranged so as to be nearly as possible of the same thickness, to prevent cracking in the shrinking. Cast iron columns are nearly twice as strong as the same metal cast in the cross shape, but the latter are more easy to examine, and if unequally thick can be rejected, while it is difficult to detect this in a hollow column. A column with flat ends, or a disk, is three times as strong as one with a round end, like a ball and socket joint, and where a column is out of the upright, so that the strain passes through its diagonal, its strength is reduced to one-third. A slight additional strength is given to a column by increasing its thickness in the middle, or giving it an entasis. One quarter of the breaking weight is a safe load. In wrought iron the tensile strength is about 20 tons per square inch. Its compressive strength is unknown, as it begins to flatten with 10 tons to the square inch. Its shearing strength is about equal to its tensile. In all riveted work, great care must be taken to have the butt-joints accurately fitted, the rivet-holes exactly opposite one another, and the rivet should fit the hole tight, and be riveted up so that it bites, and does not chatter, when struck by a hammer. A hole cannot be punched through a plate of less diameter than the thickness of the plate. The thin webs of wrought-iron plate girders should be stiffened at intervals by upright pieces, or the girder is apt to buckle or crumple up. One fourth of the breaking weight is the safe weight.

I can only add that I hope these hasty notes will give you some little practical hints, and will have the effect of drawing your attention to this most important subject; and be sure you can never rival the works of the middle ages unless you are masters of your materials, nor can you really make things reasonably beautiful without knowing the forms they will best lend themselves to, nor the places where you may safely remove and advantageously add material.

A discussion ensued, in the course of which Messrs. Gilbert R. Redgrave, Riddett, Clarkson, Aldridge, C. H. F. Leves, and the chairman took part, and the thanks of the meeting having been unanimously given to Mr. Aitchison for his valuable paper, that gentleman briefly replied on the discussion.

Votes of thanks to the chairman and the other retiring officers having been passed, the proceedings of the Association for the session 1870-71 were brought to a conclusion.

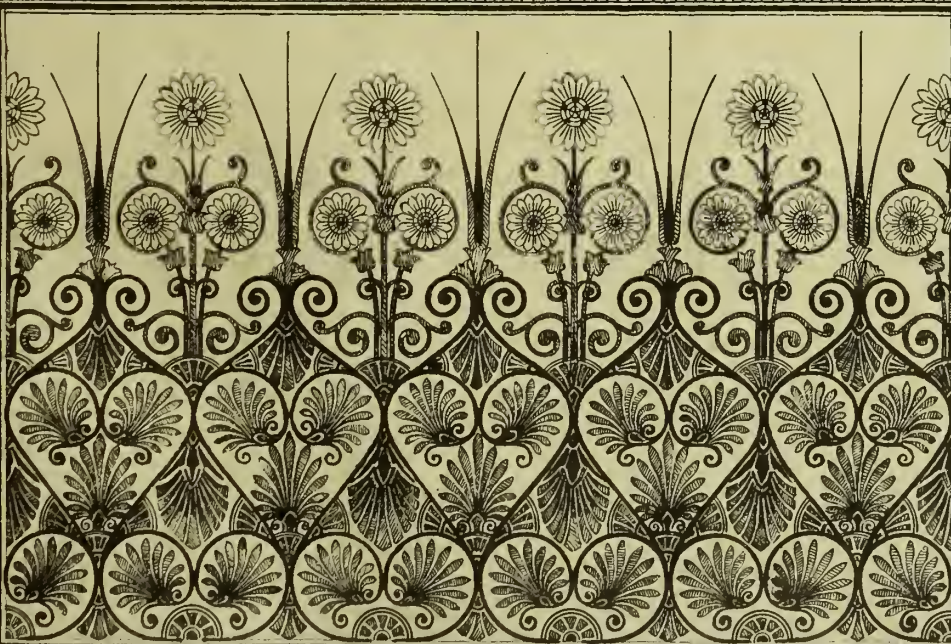
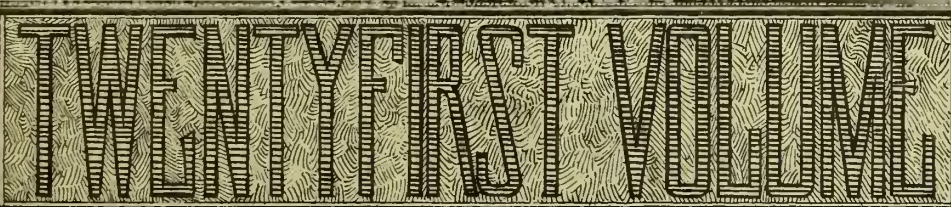
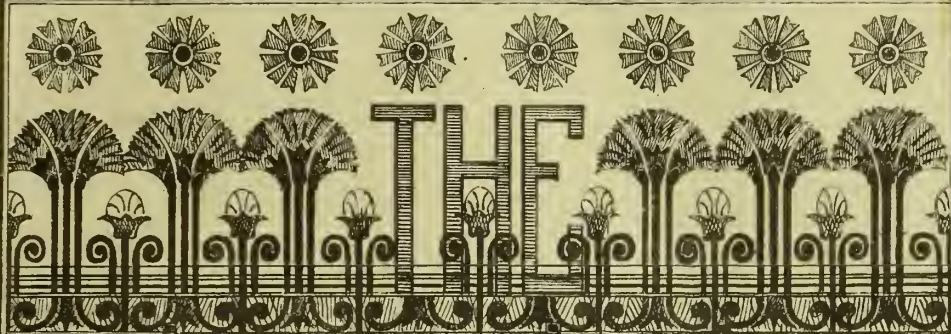
LONDON FIRE BRIGADE.—At last there is some prospect, after the loss of many lives from fire in the neighbourhood of Clerkenwell and King's-cross, of better protection being afforded to the inhabitants of those localities. The Metropolitan Board of Works has decided to remove the Farringdon-street station to a point within three-quarters of a mile of King's-cross, viz., to Coldbath-square—that is on the western boundary of Clerkenwell, and about as far from Farringdon-street as from King's-cross. This arrangement has been decided on with the view of economising the means at the disposal of the Board for Fire Brigade purposes, and it may, we think, fairly be considered that while the City will not suffer, on account of the contiguity to Farringdon-street of the Holborn, Watling-street, and Whitecross-street stations, something like protection will be afforded to a densely-populated locality.



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PROPOSED EAST END,—LITTLE GADDESSEN CHURCH.

E. W. GODWIN, F.S.A. ARCHT

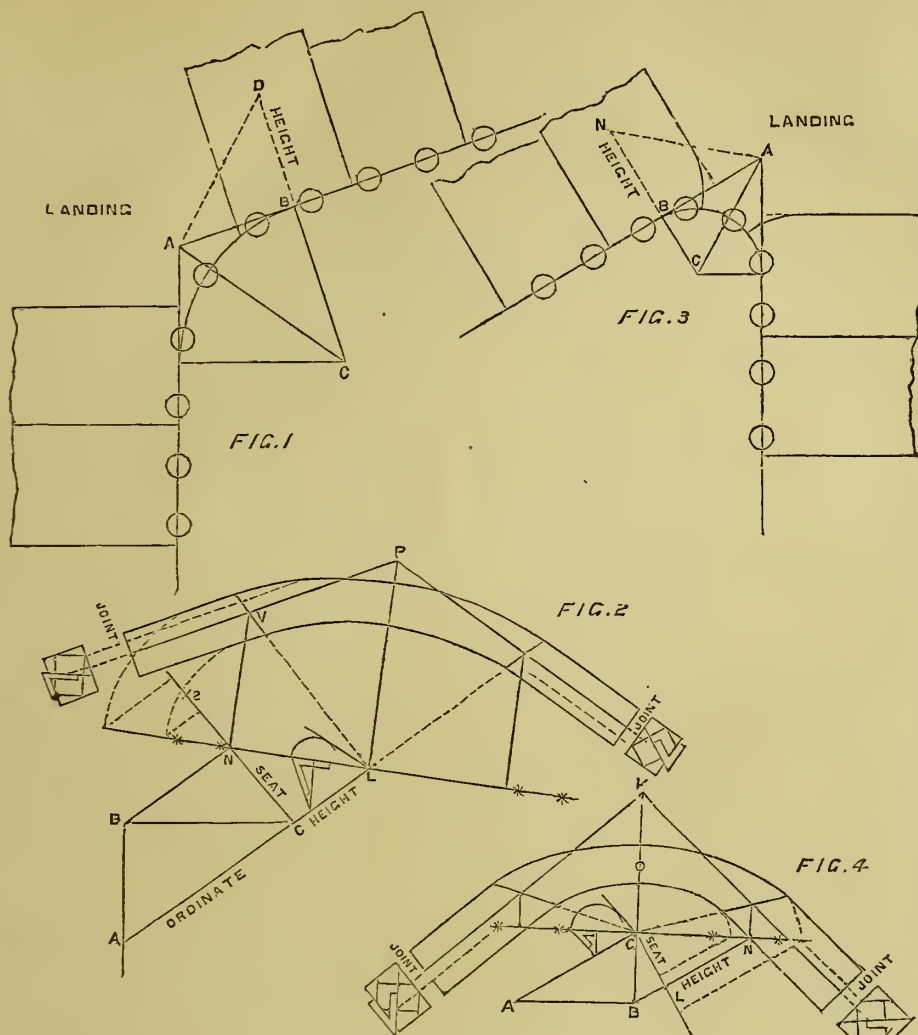




Photolithographed by Whitteman & Bass London

DESIGN FOR CORK CATHEDRAL,

SUBMITTED BY EDWARD W. CODWIN, ARCHT



NEW ELEMENTS OF HAND-RAILING.—PLATE XXXVI.

NEW ELEMENTS OF HAND-RAILING.*

(Continued from page 509, Vol. XX.)

PLATE 36.—THE WREATHS FOR QUARTER-LANDING STAIRS, THE GROUND PLANS OF WHICH MAKE ACUTE AND OBTUSE ANGLES.

TO have the wreaths in one piece, and the shanks stand on pitch of stairs. The face of riser landing and that starting, must stand half a step from intersection A, as shown at Figs. 1 and 3.

The method for position of risers has already been explained for stairs, the ground plan of which made a right angle.

The object of these drawings is to show that, although the steps and risers are on each plan precisely alike, yet the joints on wreaths require two different levels.

To illustrate this: Let us draw the mould for Fig. 1. The line A C is the ordinate, as shown at Fig. 2. Right angle A, B, C corresponds with that on plan. Draw the seat from C square with ordinate. Make B N parallel with A C. Let C L, the height, equal that of B D on plan. Join L N extended both ways. This is the pitch. Square over the lines. Let N V equal N B. Make L P equal C A. Join P V extended, and that on the right in like manner.

Now, the line P V, to be correct, must equal A D on plan.

Find the length of elliptic curves by making C 2 equal C B. Set off on each side of 2 half width of rail. Draw parallels with N B, cutting the pitch. Next, find points to insert pins. Then strike the mould. It will be noticed that the bevel is obtained by drawing a line from L parallel with tangent on the mould.

Follow the same method for every wreath, no matter what its plan may be.

The mould for Fig. 3 is shown on the right.

Letters A, B, C form a right angle, and correspond with those on the plan. Join A C. This is the ordinate. Make the seat square with it.

Draw from B parallel with A C. Let L N, the height, equal that of B N on the plan. Join N C extended. Square over the lines. Let C K equal C A.

The remainder of the drawing is sufficiently clear without further explanation.

The shanks of both these wreaths stand on the same pitch; yet the bevels for joints are entirely different.

Remember this point in all practical operations.

ON THE HISTORICAL DEVELOPMENT OF ORNAMENTAL ART.

THE thirty-seventh lecture of the course on this subject was delivered by Dr. G. G. Zerff in the Lecture Theatre, South Kensington Museum, on Tuesday afternoon last. In commencing, the lecturer said that before quitting the subject of Gothic art, it was necessary to glance for a moment at the differences and analogies between it and the art of the Greeks. Whilst with the Greeks a harmonious beauty in outer forms had reached perfection, naturalness and realism had celebrated their most glorious triumphs with the Goths. By the Greeks, Nature had been regulated, by the Goths she had been reproduced in all her variety, quaintness, and power. With the Greeks, the form of the body had been everything, and drapery had been used less to disguise than to reveal the idealised anatomy of the human frame. In Mediæval art, the body had no longer been predominant, the spirit having been most dwelt upon. This period of Mediæval sculpture and ornamentation had often been compared with the best epoch of Greek art, that of Phidias. In both epochs, we found an equal inspiration for the highest interests of humanity and a general carelessness of the material details of life. The artists had found their subjects already given. They had had a circle of typical forms, which they had inspired with a new life by their deeper feelings and more refined knowledge of nature. In both periods, architecture had been the principal element of art, and sculpture had been made subservient to its purposes. The immutable laws of gravitation had been

most carefully observed; in both periods the conoidal form, presenting the static and dynamic forces working in nature, had been clearly expressed. Though he (the lecturer) did not deny in any way the incomparable clearness of Greek art, whether architectural or plastic, he could not avoid drawing attention to the complicated variety of motives in Gothic architecture, which placed us so much nearer to nature. There were, undoubtedly, many ugly, misshapen, grotesque, and distorted figures, but in considering these we should never forget that the Mediæval artist had often to carve a geological, astronomical, zoological, botanical, metaphysical, or ethical treatise, whilst the task of the Greek had been the idealisation of the human form. It was at a later period, when the decline of Greek art had commenced, that the artists had taken up sentiment and passion. The art of the Greeks had transformed everything into the symmetrical form of a beautiful body; that of the middle ages had inspired even the loathsome forms of winding serpents, dragons, and monsters with a sublime moral idea, that of exhorting us to shun evil and to be contented with a beautiful soul. The temples of the Greeks had inclosed one divine form. In the Gothic churches, on the other hand, the pinnacles, canopies, recesses, finials, and niches had been innumerable, had contained shrines within shrines, and statues that towered above statues in all forms, from the colossal to the most minute. All had been full of expression, full of meaning; all had contributed to form in endless variety one great whole. Passing now to the consideration of the Renaissance style, the lecturer said that the changes in Europe which had been produced by the invention of the art of printing, the use of gunpowder, and the discovery of America, had found a clear expression in this style. Before entering upon the subject of wood-engraving the lecturer described some splendid specimens of caskets, plaques, panels, candlesticks, knockers, salt-cellars, and statuettes, from Germany, France, and Italy, in order to illustrate the blending of the Gothic with the antique which had formed the principal characteristic of Renaissance art. Wood-engraving had developed itself in the North of Europe, commencing with incunabula, or books printed from blocks. The fifteenth and sixteenth centuries had formed the real period of the art. During this time we had had Martin Schoen, Israel van Mecheln the elder, Israel van Mecheln the younger, Michael Wolgemuth (1434-1519), the master of Albert Dürer, and finally Albert Dürer himself (1471); contemporary with the latter had been Mark-Anton Raimondi, of Bologna (1475), Lucas, of Leyden (1494). Schafflein, Peter Woelrot, of Lorraine, Hans Holbein the younger (1495), and others, still further improved the art. The thirty years' war had put an end to xilography in Germany for a time. The Protestant spirit, however, had soon opened a new field for this art. Legends and pictures of saints ceased to afford subjects for engravings; but plants and machines, the products of Nature and science, soon replaced them. At this period Nuremberg, Ulm, Augsburg, Bâle, Strasburg, Cologne, Lubeck, Frankfurt-on-the-Maine, Mayence, and the chief towns in the Netherlands had produced more wood-engravings than all the other towns in the world put together. After the thirty years' war, life in the north of Europe had become very sober and scientific, all pictorial productions had been looked upon as futile, and it had been reserved for the practical spirit of England to revive and perfect xilography. This task had been commenced towards the end of the last century. The art had, in England, been used in its proper place, and the illustrations in books often assisted us to a better understanding of the text. The zeal with which miniature manuscripts, incunabula, and old wood-cuts had been collected had been of the greatest use to archaeology. Thomas Bewick, of Cherryburn, Northumberland (1753), might be looked upon as the second father of wood-engraving. The development of art took two distinct directions in Europe. The North turned to sober wood-engravings, the South to painting. Dark simple outlines had satisfied the Puritan mind of the North, whilst the South yearned for bright colours. Birds, as Audubon asserts, show a similar propensity. The same species build their nests totally differently in North America to what they do in the South. So it had been with men. Gunpowder and the art of printing were Northern inventions, whilst the discovery of America was the result of Southern imagination. The influence of these inventions and of that discovery upon mankind was immense. They stimulated art in the South, they produced reformers and scientific inquirers in the North. Anatomy, zoology, and botany were studied in the North. Tasso, Ariosto, were recited in public places in the South. Dark outlines made us acquainted with curious plants,

* This series of articles is a reproduction of ROBERT RIDGELL'S work on the subject, published in Philadelphia, and by Trübner and Co., London.

unknown animals, machines, instruments, and solar systems; and these matter-of-fact wood engravings had kept alive in the North a gloomy spirit of contempt for everything imaginary in the regions of higher art. Whilst "Pulcinella," dressed in a many-coloured jacket, amused the Italians with his broad jokes, we carved (in wood) cutting satires in *Punch*—and *Punch* is a perfect marvel, as far as xilography is concerned. There is power, elegance, expression, and, above all, an unsurpassed humour. Not only Dibdin, J. Thompson, Brauston, O. Smith, Landells, Gray, Wright, Folkard, Green, White, Vasey, Harvey, &c., ought to be mentioned for their exquisite works in wood-engravings, but also *Punch*. The reason why English artists succeed in caricatures is because they study, with profound diligence, Nature from her comical side. Let them only begin to study the historical development of art with the same assiduity and in the same spirit, and they are sure very soon to surpass foreign artists. The neglect of a systematic study of art history shows itself in architecture as well as in ornamentation. Poverty of thought, stiffness (though exquisite correctness) of execution, want of imagination, ignorance of proportion, and a pedantic imitation of older forms are the characteristics of our times. In xilography this is not the case. The next lecture will treat on English tombs and the beginning of Italian sculpture during the sixteenth century.

SELENITIC MORTAR.

FOR some months past a series of careful and exhaustive experiments have been in progress at South Kensington, in order to test the value of a new kind of cement and mortar. This substance is the invention of Colonel Scott, R.E., and has been freely used in the construction of the French annexe. It has been named by Colonel Scott, selenitic mortar, and the process of production consists in mixing with the water used in the preparation of the mortar, a small quantity of sulphate of lime, in the form of either plaster-of-paris, gypsum, or green vitriol. These substances having been intimately mixed, the lime is added and ground with the water or sulphate into a creamy paste. The mixture is prepared in the pan of an ordinary mortar mill, in which the water and sulphate are first introduced, and subsequently the lime. After the lime has been ground for three or four minutes, the sand, burnt clay, or other ingredients are added, and the whole is ground for ten minutes more. By this invention, ordinary lime can be at once converted into a species of cement mortar which sets rapidly and well, and can be used for concrete, bricklayer's work, or stuff for plastering at a cheaper rate than that made from lime in the ordinary way. From his experiments, Colonel Scott finds the use of sulphuric acid to give the best results, so that this substance is used in preference to plaster-of-paris or gypsum, although the latter materials will answer for all practical purposes. Sufficient acid is contained in plaster-of-paris to effect the necessary chemical change, and to prevent the lime from slaking, which in effect is the secret of the whole process. The lime, by this means, is enabled to take twice as much sand as when slaked, its fiery nature being brought under control. Any lime can be made selenitic by Colonel Scott's process, and the more hydraulic it is, the better are the results obtained with it.

The invention is not only applicable to cement manufacture and mortar mixing, but its use extends to brick making. A number of bricks have been made since the opening of the Exhibition, by Mr. Large's dry brick press in the pottery machinery annexe. These bricks are composed of one part lime to eight or ten parts sand or burnt clay, and they are found to be ready for use in about ten days after pressing, without being burned. It is found that these bricks do not swell as is ordinarily the case from the slaking tendency of lime when not made selenitic. The proportions adopted for various purposes are as follows:—Mortar for bricklaying, water half a pail, plaster-of-paris, 4lb.; mix and add in the pan of the edge-runner two or three pails of water, a bushel of lime, and six bushels of sand; grind for ten minutes. For mortar for pointing, water, plaster, and lime as before, and add two parts chalk, slaked lime or whiting, and two parts sand. For coarse stuff for plastering same ingredients as for mortar, but coarser sand, and grind for five minutes only. For fine stuff for plastering, water, plaster, and lime as before, a bushel and a half of chalk and two bushels of fine washed sand. For coarse stuff on lath add with the lime 5lb. of hair, which need not be previously beaten. For rough stucco, same as for mortar, but four bushels only of sand. Plastering on walls can be done by this process as two-coat work, whilst ceilings can be floated imme-

diately after the application of the first coat and set in 48 hours. An examination of the walls of the French annexe and some recent samples of work in the experimental yard at South Kensington, have shown us the thorough adaptability of this material to the various purpose to which we have referred. The cements are very quick setting, and they produce a very hard and finely finished surface.

Nature of Experiment.	Age of joint or sample in days.	Composition of mortar in parts.		Breaking weight of joint or sample in lbs.
2 bricks joined crosswise with selenitic mortar, giving an area of 20 sq. inches of joint	14	1 { Medway } 1 { gray lime }	3	255
Ditto	14	1 " "	4	327
Ditto	14	1 " "	5	340
Ditto	14	1 " "	6	339
Ditto	14	1 { Lias lime }	3	259
Ditto	14	1 " "	4	144
Ditto	14	1 " "	5	160.5
Ditto	14	1 " "	6	172
Ditto	14	1 { Portland cement }	4	217
Ditto	14	1 " "	5	304
Ditto	14	1 " "	6	206
Ditto	14	1 { Lee's gray } 1 { lime }	3	325
Ditto	14	1 " "	4	336
Ditto	14	1 " "	5	290
Ditto	14	1 " "	6	303
Prism of selenitic mortar 2in. x 2in. x 4in. long and 3in. between points of support.	209	1 { Portland cement }	3	668
Ditto	209	1 " "	4	476
Ditto	209	1 " "	5	344
Ditto	209	1 " "	6	190
Ditto	177	1 { Barrow lime }	4	740
Ditto	177	1 " "	5	776
Ditto	177	1 " "	6	638
Prism of mortar, same dimensions as before, but not selenitic	177	1 " "	3	440
Ditto	177	1 " "	4	338
Prism of selenitic mortar, same dimensions as before	230	1 { Lee's gray } 1 { lime }	4	806
Ditto	230	1 " "	5	722
Ditto	230	1 " "	6	876
Briquettes of selenitic mortar, — breaking area 1 1/2in. x 1 1/2in. = 2 1/4 square inches.	167	1 { Portland cement }	4	206
Ditto	167	1 " "	5	149
Ditto	167	1 " "	6	113
Ditto	132	1 { Roman } 1 { cement }	3	292
Ditto	132	1 " "	4	250
Ditto	132	1 " "	5	124
Ditto	132	1 " "	6	89
Ditto	166	1 { Medway } 1 { gray lime }	3	245
Ditto	166	1 " "	4	147
Ditto	166	1 " "	5	150
Ditto	166	1 " "	6	108
Ditto	76	1 { Halkin lime }	3	128.5
Ditto	76	1 " "	4	197
Ditto	76	1 " "	5	99
Ditto	76	1 " "	6	111

We give in the preceding table the results of a few experiments taken by *Engineering* at random from the records of many thousands made under the superintendence of Mr. Gilbert R. Redgrave for Colonel Scott, in order thoroughly to test the efficiency of his invention. The early results were so remarkable that the Colonel was induced to repeat them over and over again, and to institute many others in order perfectly to satisfy himself of the correctness of his conclusions. The most searching trials, however, have only further demonstrated the importance of the invention, which is a thorough success, and must prove invaluable in the constructive arts. Samples of this cement were exhibited at the last *conferenza* of the Institution of Civil Engineers, when a number of them were tested by Mr. Michele in his testing apparatus, and gave very satisfactory results.

As it is often found in practice that tiles bedded in Portland cement leave their setting, Messrs. Minton caused a series of experiments to be made with selenitic cement in order to test its adhesive qualities in this respect. A number of their tiles were joined together in pairs crosswise in the same way as the bricks, with two parts of ordinary Portland cement to one of sand. After allowing the joints to stand 14 days, a weight of 56lb. separated them, the cement in most cases coming clean away from the tile. With selenitic cement composed of one part lime to five of sand, the joint being 14 days old, it required a weight of 158 lb. to overcome adhesion, and then the fracture took place completely through the cement, half remaining on each tile. With one of cement to three of sand, the breaking weight was 166 lb., and with four of sand 165 lb.; the fracture in all cases taking place through the cement. These and the results given in the tabulated statement afford

conclusive evidence of the superiority of the selenitic mortar over the ordinary compositions. We may add that a briquette of ordinary mortar composed of one part lime and two of sand, six months old, usually breaks at 70 lb. or thereabouts.

A GOOD WATER-CART.

WE have lately felt but little need of the water-carts in the public streets, but the dry weather which it is to be hoped is in store for us will soon bring to our minds the necessity for their use, and the desirability of some improvement in the class of machine generally in use, which, instead of equally distributing the water and laying the dust in the roads, leaves no inconsiderable portion of its contents on the pavement, where it is not wanted, and fills the roadway with a succession of deep puddles. The Corporation of Birmingham use a water-cart which is probably as near perfection as possible, and is well worthy the attention of other governing bodies. The inventor and sole manufacturer (Mr. J. S. Oldham, of Birmingham) claims for it several advantages. The cart holds 330 gallons of water, considerably more than the ordinary cart, thus effecting an appreciable saving of time. It is also built on springs specially adapted for the purpose, which enables it to be worked with less fatigue to man and horse. It is fitted either with a single or double valve as required, and is thus suitable either for wide or narrow roads. By a simple and handy contrivance, the sprinkler can be easily removed for the purpose of cleansing, in case of stoppage of the holes by dirt. The indicator which is attached, registers, in the carts at present in use, up to forty loads of water—about a fair day's work for one cart—and, as its action depends on the cart being filled, it prevents the driver starting with only half a load of water. A new indicator, which Mr. Oldham is about to adopt, will register up to 1,000 loads, and thus obviate the necessity of daily checking the number of loads distributed. Altogether the water-cart is one of the most complete and best adapted for public use we have met with.

METROPOLITAN DRINKING FOUNTAINS ASSOCIATION.

THE twelfth annual meeting of the Metropolitan Drinking Fountain and Cattle Trough Association was held on Tuesday at Willis's Rooms, St. James's, under the presidency of the Marquis of Westminster, who, in opening the proceedings, dwelt upon the necessity of an abundant and pure supply of water as essential to the health and morality of the people. He therefore hoped the Bill now before Parliament for insuring a constant flow in all parts of London would become law before the session closed. It was said this society was doing work that should devolve upon public bodies, and no doubt that was so, but until a proper governing body for the metropolis was established, to whom the fountains and troughs could be transferred, the society's operations must be continued. Mr. Lea, the secretary, read the report, which was adopted unanimously, on the motion of Mr. A. Kinaird, M.P. It stated that the Committee have now 160 troughs and 145 fountains under their care within an area bounded by Hornsey, Hampstead, and Ilighgate on the north; West Ham, Barking, and Woolwich on the east; Lewisham, Streatham, and Sydenham on the south; and Putney and Barnes on the west. The cost of the water for some of the troughs exceeds £30 a year, and the consumption at several of them 4,000 gallons a day. At Knightsbridge and Piccadilly the troughs erected through the generosity of Mr. Henry Edwards, M.P., had proved great boons. A lady at Edinburgh had provided Hackney with its first trough, while the Baroness Burdett Contts had erected a fountain and trough near Columbia-market, and a magnificent fountain at the entrance to the Zoological Gardens, in the Regent's Park. Those in course of erection are a large and costly fountain in Piccadilly, a granite fountain and trough in the Uxbridge-road, and an expensive granite fountain and troughs at Brighton, the first contributed by the Dowager Marchioness of Westminster. An experiment is about to be made for rendering the water posts of cab-stands available for drinking purposes; and other extensions are contemplated, but the society has yet to obtain the recognition of some parishes, and notably the authorities of St. Mary, Islington. The ordinary donations for the year amounted to £1,237, as against £1,645 in the preceding year, and, but for an unexpected anonymous gift, there would have been a gross deficiency on the year of £638. The importance of the movement, nevertheless, was every year being more fully appreciated. Mr. Cowper-Temple, M.P., Sir W. Stirling, and others advocated the claims of the society to public support.

FRENCH ART EXHIBITION IN
CONDUIT-STREET.

THE large gallery of the Architectural Union Company has been taken, and is now occupied by the celebrated Parisian firm, Marnyhac & Co., for the exhibition and sale of sculpture and the other artistic works for which they are famous. Not only has the firm suffered in the general way of business in consequence of the late disasters in Paris, but their ateliers in the Avenue de Wagram (portentous name!) were seized and held by the insurgents as a post during the bombardment. The shells falling into the workshops not only put a stop to all labours, but caused the destruction of many valuable works of art. In occupying the Architectural Gallery the Messrs. Marnyhac seem to have a special claim upon our sympathies. Assuredly the gallery has never before been so worthily occupied, and long may it be so to the full advantage of the art firm, as it will be, no doubt, to the improvement of English taste!

England cannot but welcome those who, from religious or political convulsions, seek a refuge on her shores, having so wonderfully benefited in times past by the advent of those who have claimed an asylum here, as some of our chief manufactures attest. So good follows good; and it is probable our arts may now benefit similarly as our manufactures have of yore. It is possible that from the utter disorganisation of trade in Paris—the immediate effects of the past and the uncertainty of the future—that the distinguished firm (Marnyhac & Co.) may establish a manufactory here—a proceeding which could not but be expected to bear very important results, and to our manifest advantage. As it is, the permanent exhibition in Conduit-street of French art and manufactures of that elegant and refined description for which the Parisians are so famous, and in which they are unrivalled, must be hailed with pleasure. The principal artists whose works in our gallery are now exhibited are Clesinger, Falquières, Cordier, Millet, Clère, Cornu, Thomas, Lanzirotti, Marcellin, and Bartholdi. The works of Clesinger display versatility and fertility of powers in wonderful conjunctive excellence. His truthful and vigorous rendering of the lower animal life is as perfect as his beautiful creations of the human form. Here are reductions in bronze and marble of his "Le Taureau Vanquer," "Taureau de la Campagne romaine," and two humorous subjects, "L'Académie" and "Vanité." But of far greater importance are reproductions of his "Ariane," of various sizes, so as to meet the most moderate means. The celebrated original of these numerous copies was, we are told, purchased by M. Menier, the chocolate manufacturer, for £5,000, for his villa in the Park Monceau. Whether it has escaped destruction is not known. There is also by Clesinger "La Mort de Luerèce," the whole figure beautifully expressive of deep pathos; various studies in marble, bronze, and terracotta of female loveliness, such as "Fauvette," "Femme à la Rose," "Hélène," "Femme au Lierre," &c. Though in the severe style of monumental sculpture the ancients are doubtless without rival, yet in the illustration of the more domestic side of human nature, the lighter emotions of the mind, and playful passages of the feelings, the moderns can well claim originality and success, and in dealing with such none are more successful than Clesinger. The works of Cordier, styled "Sculpture Ethnographique," are to our taste more singular than beautiful, having greater reference, it seems to us, to the science of physiology than to high art. They are, however, very remarkable in their way, and their singularity and undoubted cleverness will, no doubt, find admirers. His coloured marble bas-relief must, however, be considered a positive failure. Millet's chief work is a bronze reduction of his "Vercingétorix," and a statue of a girl from the tomb of Henri Murger. Eugene Cornu's designs are here

seen worked out with great skill in combination of bronze and Algerian onyx. Though, no doubt, onyx is a beautiful material, its success has been in a great measure owing to the artistic treatment and accompaniments it has had. A pity but that the manifold beauties of the Cornish serpentine have not the advantage of similar treatment to develop and make them known.

Two silver statuettes, about eighteen inches high, the one a Venus from the antique, the other a female fondling a child, by Solan, are deserving of more than a passing glance of admiration, on account of their beauty. They might reasonably be supposed to be cast, but are made by a much more difficult process, being surprisingly good examples of *repoussé* work. These figures were executed in detached portions—flat pieces of silver, hammered into shape and joined together, and that so cunningly as to leave no visible trace of the arduous manipulative processes.

Amongst the general "articles de luxe" may be noticed a vase and candelabra of silver and rock-crystal. These were executed for the late Emperor—the imperial flower, the violet, being used in the decoration—but, in consequence of recent events, not delivered. The price is £1,600. These otherwise beautiful things are marred, we must consider, by the incongruous conjunction of the candelabra with the vase support. With French designers, however, this clumsy device is in great favour. The firm of Froment Meurice work conjointly with that of Marnyhac; and here, consequently, are to be seen numerous productions in that style, "perfect with a fine perfection," which has gained for Meurice a world-wide reputation. Here, carefully disposed in a soft, satin-lined case, is something of Meurice's—a remarkable illustration of French refined taste, manipulative skill, and conquering effort. It is a cruet and paten—"Aiguière"—the one article about 9in. high, the other about 12in. in diameter. At first sight they might be supposed to be simply enamelled glass: the material, however, is rock-crystal. The handle, top, body, and base are in separate pieces, and had to be shaped from the solid. The piece of crystal forming the egg-shaped body cost alone, before cutting, £320. Not only had it to be shaped externally, but hollowed within, which operation, it is said, took a man three years to perform. Having received its general shape, the exterior was then engraved to receive the elaborate design of gold inlay. The gold pattern was then itself engraved and filled in with transparent enamel, which had to be burnt in. The different parts were then attached together by gold bands. The price of this remarkable production is a thousand guineas. For it its manufacturer received the decoration of the Legion of Honour.

Such a prodigality of labour with so little apparent result may seem to some simply waste. But it is rash and unwise to say that painstaking labour is ever wasted. It is only by such exceptional efforts that the human powers are tested, and though the immediate and direct results may not be imposing, yet difficulties successfully surmounted serve as a stand-point for further effort, and, commanding admiration and exciting emulation, may eventually lead to important results in other directions. The Exhibition in Conduit-street will well repay a visit. We wish the Messrs. Marnyhac all success.

P. E. M.

TECHNICAL EDUCATION.

A CROWDED public meeting was held on Wednesday night at the Town-hall, Stratford, to receive a deputation from the committee of the National Technical Universities Society. Sir Antonio Brady, the chairman, said that was the fourth meeting of a series that was being held in the United Kingdom for the furtherance of the object the society had in view. It was one the importance of which could not be exaggerated. We were being left behind by foreign workmen, because they were better educated. We were losing

our watch trade, and Belgium was making large inroads upon our iron and glass manufactures. He believed that we possessed the best breed of workmen in the world, with brains equal, if not superior, to any others, and if able to start fair in competition with other nations, he had no fear of our not being able to hold our own. No workmen could equal ours at all descriptions of heavy manual labour, but he feared that in the tasteful and artistic branches of trade we were left behind by Continental artisans. If we were to hold our own as a great nation, and maintain our commerce, we must educate our people. There would then be no chance of our losing our position. If, on the other hand, we allow things to go on in their present condition, the employers would lose their trade, and as a natural consequence the artisans would lose their employment. After addresses from Mr. Scott Russell and others, resolutions in favour of the object of the meeting were adopted.

NATIONAL COMPETITION OF SCHOOLS OF
ART.

A PRIVATE view of the prize works of the art students of the United Kingdom was held the other day at the South Kensington Museum. The works of art, some 200 in number, have been selected by a committee of able and indefatigable examiners from no less than 64,608 productions sent up for competition by the local schools, and have obtained prizes of gold, silver, or bronze medals, or books. They are exhibited on screens and tables in one of the picture galleries of the Museum.

The prize works consist of studies from the antique, designs for architecture or manufactures, and studies in light and shade, colour, or from the life. They come from England, Scotland, and a few from Ireland, and the industrial works generally bear about them some characteristics of their birthplace. Thus, there are designs for pottery from Staffordshire, for scarves and laces from Macclesfield and Nottingham, for metal vases from Birmingham, and so on. A great many of the honours are carried away by South Kensington and the Female School of Art in Bloomsbury, but the provinces, excepting Ireland, are also very well represented. The examiners have not been slow to point out shortcomings, but their report shows that fair progress has been made in most of the classes. The painting from still life they especially commend, and very properly advise that oil and water colour be separated, and a gold medal awarded for each. In the studies from antique figures fault is found with the treatment of the backgrounds, which are often so darkly and laboriously worked round the figure as to interfere with the appearance of relief which ought to have been produced by its own proper standing. The students have also bestowed a great deal of wasted toil in accurately reproducing the flaws and chips of their models, when these ought to have been seized as opportunities of showing the learner's power, not of copying, but of original drawing. The excellence of the modelled works is declared by the examiners to be higher than in former years; the lace designs are commended, and Birmingham is mentioned as having reached a standard of average merit which it fell short of at the last competition.

There is no doubt whatever, says the *Times*, that all these prize works deserve high commendation when we consider the circumstances of their production, but we are constrained to say that while we observe in them great evidence of excellent teaching and aptitude for learning, we do not observe much natural genius. The examiners remark in the drawings a general deficiency in delicacy of treatment, purity of form, and in the sense of beauty. Now these three things put together mean nothing more and nothing less than that inherent, perceptive, and creative power which is called genius, which may be educated and developed, but cannot be planted by all the art-teaching in the world. A national system of art-teaching will never make and is not intended to make great sculptors and painters. Great sculptors and painters may and will, no doubt, arise who have derived their first knowledge of art from the National Schools, but they will be so few and far between, and the chances are so great that such a man, when he has arisen, would have been able to fight his way without help from the nation, that we must not deceive ourselves by imagining that these schools will ever justify themselves by producing great artists, or search exhibitions such as this for indications of that original power the large possession of which makes a Turner or a Canova. We should rather seek for what we shall oftener find—the careful workmanship, the studious application, the clever combination, and even imitation, which may be and

are of the greatest use in developing and perfecting those industrial arts and manufactures which surround us more closely than painting and sculpture, which are part and parcel of our daily life, and are furthered by these Art Schools, which thus and thus only repay their cost. For these reasons we must confess that in such competitive exhibitions as this of South Kensington we are inclined to prefer the humbler to the higher art, to turn from the drawings and modellings from the antique and from life to a design for lace or to a scroll for mural decoration. For these reasons, also, we regret extremely to see noted in the examiners' report a marked deficiency in the designs for furniture, and we seriously doubt whether the South Kensington authorities are acting wisely in giving, as they manifestly do, such great encouragement to all this drawing from life and copy of the antique. No doubt, high art is as desirable for the figures on a pot or plate as for the figures in a Royal Academy picture, but we should think this exhibition proves that the design and decoration immediately applicable to manufactures are more within the reach of our national students than the beauty of the human form or of nature.

On Wednesday the following prizes were awarded:—Gold Medals.—William Butler, Nottingham; William M. Crichton, Edinburgh; Owen Gibbons, South Kensington; George L. Luker, S. Martin's; George F. Munn, South Kensington; James Robertson, Edinburgh; Rose E. Stanton, Stroud; James Steele, Glasgow; George F. Turton, Nottingham. Silver Medals.—W. Alexander, Salisbury; A. Anderson, Glasgow; E. Austin, Bloomsbury; A. Barlow, Edinburgh; F. C. Bodkin, South Kensington; Mary E. Butler, South Kensington; J. Charnock, Bradford; George Clausen, South Kensington; John Crowther, Bradford; Susan Dacre, Manchester; Daniel Doherty, Manchester; Emma Eyles, Oxford; Tom Hunt, Lambeth; Emily Jackson, South Kensington; Paul Loeck, Hull; Marianne Mansell, South Kensington; John S. Noble, West London; John H. Park, Coventry; W. F. Randall, South Kensington; James Rowley, West London; Peter Smart, Aberdeen; Mary E. Southwark, Manchester; William Stephens, Edinburgh; William Wright, Hanley. Bronze medals and book prizes were awarded to a large number of students.

We shall speak more fully of the merits and demerits of this competition next week.

MR. BARRY AND MR. AYRTON.

The *Times* does not think that Mr. Beresford Hope and Mr. Cowper-Temple have made out such a case against the Board of Works as will induce the public to take part in the dispute against the Commissioner. The question for them will be—Was the termination of Mr. Barry's connection with the Houses of Parliament for the general advantage or not? We are constrained, the *Times* says, to believe it was, and that Mr. Ayrton, being justified on this main point, must be excused for any lack of politeness. We assume that Mr. Barry has suffered in some way, because the speeches of his friends all indicate it; but, looking to the usual relation between professional men and their employers, we cannot exactly see in what the wrong consists. The Houses of Parliament have long been substantially finished, the original architect, who alone had a moral claim to the permanent office has passed away, and no other, be he relative or stranger, has the smallest ground for insisting on being employed upon them. Looking to the number of men who have been allowed to ride their hobbies in this immense and elaborate work, we are not disposed to criticise severely any man who gives an assurance that the expenditure is at an end, for otherwise we feel that the Houses of Parliament might never be finished. It is evident that if we dissociate public works entirely from the notion of usefulness—if we build, restore, and decorate for æsthetic effect alone—there may be no limit to the eccentricity of our artists or the cost which they entail on us. We are glad to welcome firmness and economy in a department where they have long been unknown.

The *Telegraph* remarks that the House of Commons has presented a signal instance of the zeal with which the first Legislative Assembly in the world can discuss things of infinite littleness at the very moment when it is nervously keeping away from subjects of real importance. Its own proceedings were really a dramatised satire on itself, and in no theatre could the comedy have been more cleverly performed by every actor on the stage.

The *Post* says that the whole debate represents very fairly the state of mind into which the House of Commons always drifts when dealing with any question of art. The true art critic is never happy but when he is soundly belabouring the artistic

errors of others; and in the person of the First Commissioner of Works there is a most inviting scapegoat always ready to be sent out into the wilderness. Though ready, however, he is never willing; and the result is that whenever public statues, parks, or buildings are under discussion there may always be produced the most instructive and amusing mixture of art and personality. But it is greatly to be doubted whether any kind of good is ever likely to arise from such displays as that lately afforded, and for the present it would seem that we must continue to possess the least beautiful structures of any capital in the world, to pay more than any for them, and then to find that we have not only behaved badly to the architect, but have failed to please Mr. Beresford-Hope.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

GENERAL CONFERENCE, 1871.

RESOLUTIONS.—At an adjourned meeting of the Conference, held at the rooms of the Institute, on Friday, the 26th of May, 1871, T. H. Wyatt, P.R.I.B.A., in the chair, it was resolved, with regard to

Professional Charges.—1. That the Council of the R.I.B.A. be requested to refer the various questions connected with professional charges to the Professional Practice Committee of the Institute, or to a sub-committee of that body, with the addition of the names of Mr. Hine, the President of the Architectural Alliance, Mr. T. H. Watson, the President of the Architectural Association; and of Mr. Douglas Matthews, who will aid the Secretary of the Institute in ascertaining the views of country architects on these questions; and that their report, when sanctioned by the Council and confirmed by a special general meeting of the Institute, be issued to those members residing in the provinces who have been invited to attend this Conference. That the details of this report be discussed at a general Conference, which it is hoped the Institute will again convene in the month of June, 1872, so as to insure the greatest unanimity of action and opinion amongst the whole body of professional men in the United Kingdom.

Architectural Competitions.—2. That with reference to the subject of "Architectural Competitions," the Council of the Institute be requested to appoint a special and permanent Committee, viz.:—One member from the Council, one member from the Fellows, one member from the Associates, one member from the Architectural Alliance, one member from the Architectural Association, with the addition of Mr. A. Strong, who will aid the Secretary of the Institute in ascertaining the views of provincial architects on these matters. That this Committee be requested to take into consideration the various papers or proposals that have been issued on this subject by the Institute, by the Alliance, and by the Association, and to base on these documents, and such other evidence as may be obtained, some clear and short conditions, which, when fully sanctioned, as hereafter described, shall be issued as a document to be generally adopted by all architects in professional competitions. That this report, when sanctioned by the Council and confirmed at a special general meeting of the Institute, duly convened for the purpose, be forwarded to those members residing in the provinces who have been invited to attend this Conference; and that the same report be submitted for approval at the next general Conference (which it is hoped the Council will convene in the month of June, 1872), so as to insure perfect unanimity of action and opinion amongst architects practising in this country. That this Committee shall be requested to act as a permanent committee, to put themselves in communication with all promoters of competitions, forwarding them a copy of the several conditions agreed upon as the only terms on which architects should enter upon the competition, and publishing in the professional papers the result of this communication for the information of competitors and of the public; it being understood that this action shall not take place until after the report has been discussed and confirmed at the Conference in 1872.

Employment of Surveyors.—3. That with reference to the appointment of surveyors to take out quantities (a custom on which evidently a good deal of difference of opinion exists) the Council of the Institute be requested to appoint a committee of five or more members; and that with a view to assist the Institute Secretary in obtaining provincial opinion on this matter, and as representing the views of the surveyors, that the names of Mr. Arthur Cates and Mr. T. M. Rickman be added to this committee; and that the report of this Committee should be

dealt with in the same manner as has been suggested in the two former cases.

Professional Education.—4. That the Institute be requested to let the committee of its body who are now dealing with the subject of professional education, viz., the Voluntary Architectural Examination Committee, continue their labours so as to have the matter fully discussed and disposed of at the Congress in 1872.

VOTE OF THANKS.—Resolved: That the best thanks of the delegates and provincial architects who have attended the Conference be offered to the President and Council of the Institute, to the secretaries of sections, and to the secretaries and other officers of the Institute for the great efforts they have made to realise this Conference, from which so much benefit to the profession is anticipated, and for the uniform kindness and courtesy extended to all attending the Conference.

At a special meeting of the R.I.B.A. Council, held on Monday, the 19th June, 1871, the above resolutions having been discussed, and, after a few verbal corrections, approved, it was resolved that the following gentlemen be appointed on the select committees above mentioned:—

Professional Charges.—Messrs. C. Barry, W. Burges, T. C. Hine, R. Kerr, T. H. Lewis, T. Roger Smith, T. H. Watson, and J. Douglass Matthews (Acting Secretary to Committee).

Architectural Competitions.—Messrs. C. Barry, R. Kerr, R. P. Spiers, T. Roger Smith, T. H. Watson, and A. Strong (Acting Secretary to Committee).

Employment of Surveyors.—Messrs. H. Currey, C. Fowler, J. Jennings, J. T. Knowles, W. Papworth, and Arthur Cates and T. M. Rickman (Acting Secretaries to Committee).

PARLIAMENTARY NOTES.

THE THAMES EMBANKMENT.—Mr. Gladstone on Monday nominated the Select Committee on the Thames Embankment, to consist of the Chancellor of the Exchequer, Lord J. Manners, the Attorney-General, Mr. W. H. Smith, Sir W. Tite, Mr. B. Hope, Mr. V. Harcourt, Mr. Anderson, Mr. J. Locke, Mr. Laird, and Sir F. Heygate. Power to send for persons, papers, records. Five to be the quorum. Agreed to.

THE INDIAN ENGINEERING SERVICE.—In reply to Mr. Fawcett, Mr. G. Duff said that the recent examination for the Indian Engineering Service at Cooper's-hill College was for guaranteed appointments, but it did not exclude candidates who competed for such appointments without going to that institution.

METROPOLITAN BUILDING ACT (1855) AMENDMENT BILL.—This bill passed through committee in the House of Lords on Friday.

THE SOUTH KENSINGTON MUSEUM.—Mr. Fletcher asked the First Commissioner of Works if he would lay upon the table of the House a copy of any correspondence that might have taken place between the Government and the authorities at South Kensington and Jermyn-street Museums, with reference to the transfer of any of the departments at present carried on in Jermyn-street to South Kensington, together with a copy of any correspondence that might have taken place between the Government and their scientific advisers bearing on this subject. And if he would undertake that no transfer of the kind alluded to should take place without an opportunity being given for Parliament to discuss the policy of any change that might be contemplated.—Mr. W. E. Forster said a letter had been received from the authorities at the School of Mines, but it was a letter for the information of the noble lord the Marquis of Ripon and himself in order to assist the Government in forming an opinion on the subject, and it was not to be expected that such a correspondence between the heads of a department and the officials in that department would be laid on the table of the House. With regard to the second question, there would be no attempt to pledge the House or the country in any way until there had been a full opportunity for discussion.

EPPING FOREST.—Mr. Ayrton obtained leave on Tuesday to introduce a bill in regard to Epping Forest, with the object of giving effect to the address of the House to the Crown on the subject.

Mr. George Sturt has received the honour of admittance to the full membership of the Royal Academy.

From a conversation recently reported in the House of Commons, the *Athenæum* has reason to fear that the wretched statue of Sir R. Peel, by the late Baron Marochetti, removed by decision of the House from Palace-yard, and understood to have been melted long ago, is still in existence, and, what is worse, that the notion of replacing it before the public eye has occurred to some active official brain.

Building Intelligence.

CHURCHES AND CHAPELS.

BATH ABBEY RESTORATION.—On Monday afternoon, a meeting was held at the Guildhall, Bath, for the purpose of considering whether a house-to-house canvass should be made, for the purpose of raising the remainder of the sum required for the restoration of the Abbey. The committee who have the superintendence of the undertaking are just on the eve of entering upon the third and last portion of the work, the estimated cost of which is £5,000. A few days since a circular was issued to the inhabitants, appealing for subscriptions towards the sum, and intimating that a personal application would follow in the course of a few days. The subscriptions having come in more freely than was anticipated, the question as to the canvass was reconsidered. The Mayor, in introducing the business, said that if they resolved to have a canvass, it would be necessary to appoint a committee to undertake the work. They were aware that the Rev. Prebendary Kemble had offered to give £25 to every £100 collected, and the treasurer (Mr. Gill) has already drawn from the rev. gentleman the sixth £25; so that the appeal so far had not been in vain—indeed, it had been very successful. His worship read a letter from Messrs. Phillips & Wilcox, ironmongers, of Melsom-street, offering to give an inner wrought-iron gate for the west door of the Abbey, according to a design that Mr. G. G. Scott, the architect, might furnish. The firm had previously made the offer, but they had not heard from Mr. Scott. The following motion was then adopted on the motion of Mr. Hunt, seconded by Mr. Milsom:—"That this meeting, regarding with great satisfaction the encouraging response that has been made to the Abbey restoration, which they hope will be maintained, resolve to adjourn the question of a personal call upon the inhabitants to the next meeting." It was also agreed to extend the appeal to the rural districts.

BLISWORTH.—On Tuesday week special services were held at Blisworth, in connection with the laying of a foundation-stone of a considerable enlargement of the Baptist Chapel and a new school-room in connection with it. The enlargement of the chapel will consist of an extension to the front of some eighteen feet—the arrangement providing additional accommodation for some ninety-six persons. The proposed new frontage will be somewhat more tasteful and imposing than the one which has stood since the erection of the chapel, but its style is simple and substantial in appearance, as seen on the plans. It was originally intended to have Bath stone dressings, but ultimately dressings of white brick were substituted. The work will be carried on from the designs and under the superintendence of Mr. W. Heygate Vernon, architect, of 12, Denbigh-place, London, S.W., the builder being Mr. Johnson, of Collingtree. The exact cost is estimated at £700 or £800.

BOLTON.—Last week the new parish church at Bolton, erected by Mr. P. Ormrod, of Halliwell Hall, at a cost, up to the present, of considerably over £30,000, and the ultimate cost of which when completed will not be far short of £50,000, was consecrated by the Bishop of Manchester. The new church is supposed to be the fourth edifice which has been built on the present site. The church, which has been designed by Mr. Paley, is in the Geometric Gothic style, and is cruciform in plan. The east window is in seven lights, and is filled with stained glass illustrative of the life of S. Peter, to whom the church is dedicated.

HARBERTON.—The rood-screen in the Church of S. Andrew, Harberton, about three miles from Totnes, has just been restored. The screen is of a description seldom met with elsewhere than in Devonshire, though in that county there are several bearing a marked resemblance to each other, and erected no doubt at about the same time—probably the fifteenth century. The screen at Harberton extends across the church, and is open and elegant in its structure. Separating the sections of the screen are two pillars. In the centre of that on the north side is a figure of our Saviour holding a chalice in his left hand, while his right hand is raised in the act of benediction. This pillar is surmounted with a rich canopy of gold, and a light blue background. Its beauty is much enhanced by the rich vermilion and green that are introduced. There are two openings in the screen, and a central doorway leading into the chancel, with two other divisions. The southern pillar has a painting of the Virgin and Child, copied by Mr. Francis Lane from an original painting by Parmigiano. This is surmounted by a canopy. The top of the screen, which is several

feet broad, is supported by fanlight extensions, with golden bosses, relieved by colours having for its base a succession of knots in gold forming a beautiful supporting line; above is a dark ornamented moulding, which serves to throw out another rich line consisting of grapes and vine leaves in green and gold. Above this is a line of vermilion, surrounded by a series of *fleur-de-lis*, forming the base of the grand scroll at the top, in which there are ornaments similar to the lower one, with bunches and vine leaves much larger and more enriched, if possible, than the lower line.

KEARSLEY.—The new Church of S. Stephen, Kearsley Moor, was consecrated on Saturday by the Bishop of Manchester. Accommodation is provided for 500 persons, and all the sittings will be free. Its plan consists of a nave 67ft. long by 24ft. wide, and a north aisle the same length by 20ft. wide; and the design also comprises a south aisle, not yet built. The tower is upwards of 60ft. high, and bears an inscription to that effect carved upon a marble tablet set in a framework of moulded stone. The style is well-developed Decorated. The inner stonework is white and red, an intermixture of colour which adds pleasant warmth of effect to the interior. The contract was taken by Messrs. Ellis and Hinchliffe, and the work has been carried out by them under the superintendence of the architects, Messrs. Medland and H. Taylor, of Manchester. The cost was £3,000.

KENNINGTON.—The foundation-stone of the new Church of S. John the Divine, Kennington, was laid on Tuesday afternoon by the Bishop of Winchester. The new church is to be erected on a site abutting on the Vassall-road, and is intended to afford sittings for a congregation of 1,000 persons, all free and unappropriated. The structure, as shown in the drawings of the architect, Mr. Street, will have an imposing and picturesque appearance, and the site is surrounded by a beautiful shrubbery.

LINCOLN CATHEDRAL.—The restoration of the north arm of the great transept of Lincoln Cathedral is making good process. The whitewash and plaster have been removed from the roof, and it is in contemplation to restore the picturesque bordering. The marble columns are also being restored.

LIVERPOOL.—The new Church of S. Bridget, Wavertree, Liverpool, will shortly be consecrated. The entire dimensions of the ground upon which the church stands are 126ft. by 111ft.; and in order to utilise this space so as to afford as much accommodation as possible, the architect discarded the ordinary deep chancel, and allotted only a small portion of the ground east and west to an apse and a narthex, thus causing the choir to occupy the easternmost bays of the nave. The church consists of a nave, 92ft. by 33ft. 5in. and 47ft. high; aisles, 91ft. by 8ft. 6in. and 23ft. 6in. high; a semi-circular apse at the east end, 17ft. 3in. deep, 28ft. across, and 40ft. high; a narthex or vestibule, 36ft. 5in. by 7ft. 6in. and 16ft. high, inside measurement. It will be seen by these dimensions that the nave is of considerably more than the ordinary width, and that the aisles are narrower than usual, the obstructiveness of the nave columns being thereby considerably reduced. As this arrangement would have necessitated unusual strength in the walls to have supported a proper open-timbered roof, and it was doubtful whether good acoustic properties could have been secured, the architect determined to adopt the proportions and style generally of the Basilicas. Externally the church is constructed of gray brick, with facing of picked bricks and alternate courses of red and blue bricks, from the ground to the upper stage of the campanile; the cornices, parapets, panels, and other dressings are in local red sandstone, polished. The campanile is 110ft. high. In this church the ceiling of the nave is coffered in 27 square panels, each 1ft. 9in. deep, with the cross and circle, as symbolical designs, introduced at the junction of the beams throughout. The choir is reached by three steps of white marble, and three steps of black marble lead thence to the sanctuary. The architect is Mr. Heffer, of Liverpool; the contractors, Messrs. Nicholson and Ayre, Toxteth Park; clerk of the works, Mr. John McLaren.

OXFORD.—A movement has been set on foot among the Wesleyan body, with the object of erecting a chapel at Oxford in memory of the two Wesleys, John and Charles. The estimated cost of the new structure is set down at £15,000, and a committee, consisting of the trustees of the present Oxford Chapel, Dr. Jobson, late President of the Conference, and many other eminent Wesleyan ministers, has been appointed to carry on the movement.

BUILDINGS.

ATHENÆUM, CAMDEN-ROAD.—The first portion of the above building was opened on Saturday, July

1st, by Sir Sidney Waterlow. It consists of a hall, 60ft. long, 50ft. wide, and 35ft. high, and under it a supper-room and platform retiring-rooms. The second portion, which is to be proceeded with, will comprise reading and public rooms, each 32ft. long, 27ft. wide, and 18ft. high, a library and other rooms to be used as offices, class-rooms, and retiring-rooms, besides keeper's residence, with spacious passages and landings. There will be entrances to a through passage both from Camden and Park-roads. The architect of the building is Mr. Frederick R. Meeson.

LLANILLECH HOUSE, now in course of erection, promises to become one of the finest mansions in Monmouthshire. Among its most striking features are two lofty towers, one of which is to be used as a reservoir for water brought by pipes from the higher lands, and the other contains a smoking-room which will command an extensive and very pleasant landscape. The building is mainly composed of carefully-chiselled Forest of Dean stone, facility for the transport of which is afforded by the river Usk. The house is erected for Josiah Richards, Esq. Mr. E. Duncan is the architect, and Mr. J. G. Parfett the builder.

NEW GAIETY THEATRE, DUBLIN.—On Saturday last the foundation-stone of a new theatre to be called the New Gaiety Theatre, was laid in Dublin by the Lord Mayor of that city, after which a banquet was held. Mr. Phipps, the well-known theatre designer, is the architect, and Mr. John Gunn, of Dublin, the builder. At a time when so many people in Ireland are talking about "home rule," it is a pity the people of Dublin were obliged or felt inclined to go to Paris for a name for the new theatre, and particularly as one by the same name has recently been erected in London.

PRINCE OF WALES THEATRE, BIRMINGHAM.—Considerable improvements are now in progress at this theatre during the summer recess. The entrances to the stalls and boxes are removed, so as to make the approach at the back of the theatre instead of at the stage end as formerly. Refreshment and retiring rooms, and scene docks are being built, and balcony stalls formed, with new seating and chairs throughout. The work is being done by Messrs. Cresswell and Sons, of Birmingham, under the direction of Mr. C. J. Phipps, F.S.A., architect, of London.

THE NEW WORKHOUSE FOR THE BRAMLEY UNION.—Messrs. C. S. and A. J. Nelson, of the Albert Chambers, Park-row, Leeds, the architects of the new workhouse now in course of erection at Armley-hill-top, for the Bramley Union, have completed additional plans for the construction of an infirmary, and also of infectious wards contiguous to the main building, and it is expected that the work will be shortly commenced. Preserving the domestic character of the architectural style adopted in the workhouse, these important additions to the Union buildings harmonise well with the principal block. The buildings are in parallel blocks, each about 150ft. in length and 20ft. in width, and they can, when necessary, be easily and economically extended. The upper portion of each building is devoted to dormitories, which are reached by 7ft. wide square stone staircases. There are earth-closets throughout, separate washhouses, and a disinfecting apartment. It is estimated that the cost of the infirmary and the infectious wards will be about £3,000; that of the workhouse is to be about £9,000.

ART TREASURES OF THE LOUVRE.—It is now certain that the art treasures of the Louvre and Luxembourg are safe. Immediately after the catastrophe of Sedan, the most valuable pictures of the Louvre were packed and sent off to Brest. The others, with the marbles, packed away in the vaults at each Palace; manuscripts, &c., being put inside sarcophagi and cemented in. The lower windows of the Louvre were built up, and every possible precaution taken against fire. By the courage and ready wit of the officers and attendants, who faithfully remained in charge, the delivery of the collections to the Communistic officers was delayed until M'Mahon's entry released them from danger.

THE NEW POSTAL RATES.—The new postal arrangements will come into operation on the 1st of August. The scale will be:—For parcels and letters of all sorts, closed or open, making no distinction between them, as follows:—Not exceeding 1oz., 1d.; above 1oz., but not exceeding 2oz., 1½d.; above 2oz., but not exceeding 4oz., 2d.; above 4oz., but not exceeding 6oz., 2½d.; above 6oz., but not exceeding 8oz., 3d.; above 8oz., but not exceeding 10oz., 3½d.; above 10oz., but not exceeding 12oz., 4d. Twelve ounces to be the limit of weight for letters.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

Correspondence.

STEVINGTON CHURCH, BEDFORDSHIRE.

To the Editor of the BUILDING NEWS.

SIR,—Permit me space for one or two remarks on the letter of your correspondent which appeared in your columns of last week respecting the proposed restoration of this church. It does seem to me that the ground "Ecclesiologist" takes in questioning the safety of the restoration in the hands of the appointed architect is one which is anything but fair towards those members of the profession whose practice has mainly to do with Nonconformist erections. While I fully admit the truth of those articles your paper contained some time since on "Nonconformist Architecture," and am in no way blind to the fact that a large number of dissenting architects are behind in the race—lamentably so,—yet I submit there are also men whose knowledge of Mediaeval work is not of the limited character which it is generally supposed to be, and yet their practice is of the kind in question; but, working in their particular branch, they are doing their best to raise in truth and in tone that branch to a level which at least will bear the criticism of those who are capable of speaking upon it. And I venture to assert these are worthy the honour of restoring a Mediaeval building, and perhaps would do it as faithfully as many an "Ecclesiologist."

I cannot speak of the merits of the architect in question. It is not in my province to do so, and I do not know him personally; but I simply ask space to enter my protest against the theory that because a man's practice consists in the erection of chapels and schools for Dissenters that, therefore, he is unfitted to restore an ancient church.

I believe Mr. Rickman, who certainly was a pioneer in his day, was a Quaker—one surely, according to your correspondent's theory, the least likely to know aught of Mediaeval architecture, and yet with us still he is quoted as an authority of no little weight.—I am, &c.,

London, July 3.

W. R.

P.S. I enclose my card.

SIR,—The letter of "Ecclesiologist" in your last issue should not be passed by without a word or two. I must here mention that I have no knowledge of the architect referred to in his letter, but I feel that justice should be done, both to him and to any who might be in a similar position.

Because an architect's practice chiefly consists in "the erection of chapels and schools of the Baptist and other persuasions," is that any reason why he should be denounced in a widely-circulated public journal for carrying out the restoration of a village church? No doubt, irreparable mischief is done in the so-called restorations; but I consider that this is not the age for persecuting Nonconformist architects because they are such—rather, on the other hand, let them have an opportunity of showing their skill, and I have not the slightest hesitation in saying that their work will compare favourably with many ecclesiastical men.—I am, &c.,

H. W. P.

London, July 3, 1871.

THE STREETS OF LONDON.

SIR.—Gravite, Macadam, wood, and asphalt have been under competitive trials at various times as materials for street paving, and all have been found wanting on some special point. Granite, in the form of larger or smaller sets, is very durable, though expensive, and very destructive both of horses and carriages, not only on account of its extreme hardness, but more especially because under heavy traffic the blocks or sets sink unequally, as may be readily seen by straining a chalk line over their tops, a fault that cannot be prevented on account of the rotten state of the under soil. Consequently both the wheels and the horses suffer continually from the terrible blows in slipping from stone to stone, at the same time causing the insufferable rattle and

clatter of London traffic. What would be the result of a four-mile course on granite paving to high-bred racers? They would never be able to run another.

Macadam's system, which causes much less wear and tear to wheel-tire and horse-flesh, is found to produce dust and mud without end, and requires frequent repairs. It also settles into hollows, as proved by frequent patches of broken stone laid down here and there. It should be observed, however that the Macadam system has never yet obtained a fair trial by being rolled before use, with a twenty or twenty-six ton steam-roller.

Wood paving is excellent in preventing the wear and tear of cattle and wheel-tire, but is objected to as being slippery in certain states of the weather. This material has also missed having had a fair trial for two reasons—namely, various attempts to introduce patent systems of cutting small blocks of wood into fancy shapes, instead of cross-cutting whole trunks of large trees into broad circular disks of proper thickness, and filling the interstices with lesser blocks, wedges, and pegs, the whole being rammed down to surface by the monkey of a travelling pile-engine. The slipping complained of is caused by the horse stepping off rough gravel roads on to a smooth surface, but if all the streets were smooth-paved, no slipping would take place.

Asphalt forms a beautiful and lasting surface, but the mode of laying it down requires much improvement. It is less subject to settle into hollows, and cattle and wheel-tire would last three times as long as upon any other material. Also, as with wood pavement, slipperiness would be no objection if all the streets of London were asphalted.

The tripping and falling of horses in London streets, as elsewhere, is due to various causes—namely, bad or insufficient food and overwork, in the first place; and, secondly, to the custom of tying up their heads with the barbarous bearing-rein, which effectually prevents them recovering themselves. Also to the high style of driving, which is to hold the reins in both hands, and bearing upon them with the weight of the body by leaning backwards. Horses that have not been ruined by ignorant breakers, grooms, and mischievous boys, require no bearing-rein, will obey the slightest touch of the reins, and even a whisper inaudible to bystanders. With early training and handling, not breaking, a vicious or obstinate horse would become a rare animal indeed.—I am, &c.,

Reading.

C. E.

"CAVE AB HOMINE UNUS LIBRI."

SIR,—Has not the author of the review in last week's issue on "Architectural Books" given a queer interpretation to this proverb? He appears to make it rather eulogistic of its subject; but, while far from denying the advisability of studying one book thoroughly, in preference to many cursorily, it seems to me that the proverb is rather intended to warn against those of one book only, or of one side only of any subject.—I am, &c.,

T. H. E.

XYLATECHNIGRAPHY.

SIR,—Replying to your correspondent "An Experienced Workman," we beg to say we do not claim to have invented the process of staining deal, &c., nor do we claim to imitate other woods. No doubt, many attempts have been made in this direction, with more or less success. But we do claim to have invented a new process of staining, by which we can produce effects never before obtained, and we believe this process to be so entirely original as to be easily protected by the patent we have taken out.

If your correspondent will favour us with a call, and will produce his specimens, we have no doubt we can convince him of this.—We are, &c.,

GEO. TROLLOPE & SONS.

Halkin-street West, Belgrave-square,

London, June 29, 1871.

ARCHITECTURAL PRACTICE IN DERBY.

SIR,—A letter, signed "Architect," in your paper of the 30th June, censures us as architects to the Derby Board of Guardians for what is termed a breach of professional morality.

We will not enter into controversy with an anonymous correspondent, but if he will publish his name and address we will, with your permission, give an explanation in your columns which will place the matter in quite a different light.

We would suggest that before the writer again appoints himself arbiter in any public matter he should understand the subject, and avoid a display of ignorance, combined with conceit, for the purpose of insult to an office whose professional standing may be equal, if not superior, to his own.—We are, &c.,

GILES & BROOKHOUSE.

S. Peter's-bridge, Derby, July 3, 1871.

Intercommunication.

QUESTIONS.

[2257.]—**Fire and Pine.**—Will any contributor kindly inform me what difference there is between fir and pine? Also, what does "face-bedded" in masonry mean?—TRY AGAIN.

[2258.]—**Mounting Competition Drawings.**—I should feel obliged if any reader would kindly favour me with the neatest and best system for mounting competition drawings upon mill-boards.—J. R. S.

REPLIES.

[2250.]—**Logarithms.**—As a general rule, the only way to treat fractional exponents is by the use of logarithms. The particular example given, however, can be evolved without their use, for $9^3 = (3^2)^3 = 3^6 = 2187$.—T. H. E.

[2255.]—**Measuring Brickwork.**—The usual method of measuring brickwork of chimney-shafts is to compute the net cubic contents of the brickwork, and then reduce the same to the standard thickness of 1½ brick thick. In some parts of the country the brickwork of chimneys is estimated by the cubic yard. No allowances are given for plumbings or angles, unless you have purpose-made facing-bricks; in that case the measurement of the corners is given in lineal feet.—THOMAS PINCH, Surveyor.

LEGAL INTELLIGENCE.

FRACAS IN THE PRESTON COUNTY COURT.—On Tuesday, in the Preston County-court, Mr. James Hibbert, architect of that town, sued Mr. Edward Swainson, spinner and manufacturer, and the Rev. W. T. Thompson, incumbent of S. Saviour's Church, Preston, to recover £3 3s., his charge for supplying a plan and drawing for a stained-glass window, to be placed in that church.—The plaintiff stated that about two years ago Mr. Thompson spoke to him about preparing the plan and drawing in question. He sent in his account to the Rev. John Wilson, incumbent of S. James's Church, who was executor of the building fund of S. Saviour's, but that gentleman declined to pay, on the ground that he had nothing to do with ordering them. After that he told Mr. Thompson he should look to him for the money, and sent a bill to him, but he took no notice of it. Mr. Swainson had called upon him with Mr. Thompson, and had indicated what he wanted.—The Rev. J. Wilson said the plan and drawing were in the possession of Mr. Swainson, who ought, undoubtedly, to pay for them. If things had gone pleasantly, and there had been good funds in hand, he (the witness) would not have demurred to paying.—The Rev. W. D. Thompson said that, as far as he could remember, he and Mr. Wilson called upon Mr. Hibbert at his office, in the first instance, and he believed that he (the witness) instructed Mr. Hibbert to make the drawing. He supposed that he would be paid out of the building fund.—Mr. Swainson deposed that he never gave any instructions to plaintiff. He would take that opportunity of giving an unequivocal denial to every word that that fellow (pointing to the Rev. Mr. Wilson) had stated. (Surprise.)—His Honour made an order that the Rev. W. D. Thompson pay the amount claimed.—As the parties were leaving the court, Mr. Swainson called the Rev. J. Wilson "a lying scoundrel," in the passage, upon which the Rev. gentleman struck him across the face with his umbrella. Mr. Swainson was making a rush at him, when he was pinioned by Mr. Shorrocks, grocer, who begged him to control himself, and not strike Mr. Wilson.—Mr. Swainson: "Well, I'll not strike him—I'll not strike him," and he left the court-house.—The incident created some uproar for a time.

WATER SUPPLY AND SANITARY MATTERS.

THE SUPPLY OF WATER TO THE METROPOLIS.—A long report was presented to the Metropolitan Board of Works on Friday last and adopted from the Parliamentary Committee on the Metropolis Water Bill, which detailed the course taken by the Select Committee of the House of Commons to whom the Bill had been referred, and stated that since the second reading it had been so altered and emasculated by the Committee as to completely destroy all that was valuable in it in reference to the interests of the consumers, and gave instead increased advantages to the water companies. The Board was represented by counsel before that Committee, and they called upon the Board at a short notice to submit clauses to carry out the object they had in view. The Parliamentary Committee of the Board accordingly met at a very short notice, and Mr. Smith, their solicitor, drew up clauses which if adopted would have restored the Bill to its original shape, and they were submitted to the Select Committee of the House of Commons on Monday last. The Committee, however, in consequence of some intimation from the counsel on each side, had adjourned until Wednesday week, when those clauses would be taken into consideration. The measure as originally introduced by her Majesty's Government met with the approval of the Board, because it dealt with the question in a manner befitting its importance to the inhabitants of the metropolis, as provision was made for a constant

supply of water at high pressure, so as to force the water to the tops of the highest houses in the water companies' district, and the Board were to make regulations as to the conditions and mode of the constant supply, fittings, and to see to the prescribed purity of it by a daily analysis. The Bill also authorised the Board to have power to purchase the undertakings of the companies either compulsorily or by agreement. As soon, however, as the provisions of the Bill became known, the whole of the metropolitan water companies were aroused against it, and a combined effort was made to prevent the second reading, and they stated their strong objection to all the important provisions of the Bill. The objections of the water companies had such weight with the Government that it was determined to withdraw the original measure and to substitute the present Bill now before the Select Committee. This Bill was practically reduced to one for the establishment of a constant supply, and even that was to be much less effective than was originally proposed, as the pressure was not such as to reach the tops of the highest houses, and the cost of all the fittings for the prevention of waste was to be thrown upon this Board. It was now proposed that the companies should make their own regulations and that the Board should simply have the power of objecting and making suggestions to the Secretary of State, to whom the regulations were to be submitted for approval. The Committee considered this new provision to be a serious defect in the Bill, for although it was true that the Board would have the power of objecting to any regulation which they looked upon as vexatious and unnecessary, they could not enforce their objections. They could only submit them to the Secretary of State, with whom would rest the power of allowing or disallowing them. Doubtless that was better than leaving the matter entirely to the companies, but it would be much more satisfactory that the regulations should be made by the Board as the municipal authority than that they should only have a power of appeal. As to another provision of the Bill, that all expenses connected with the preparation and passing of the Act should be paid by the Board, that was quite unreasonable, and therefore the Committee felt bound to take the course which they then reported to the Board.

STATUES, MEMORIALS, &c.

PLYMOUTH.—A statue of Sir Francis Drake is to be erected over the municipal offices at the New Guildhall at Plymouth.

BRADFORD.—The committee who have in charge the erection of a statue to Mr. S. C. Lister at Bradford, some time ago decided to erect the memorial in the centre of the open space at the junction of New Market-street, Manchester-road, and Thornton-road, subject to the approval of the Corporation. The Finance Committee will, at the next Council meeting, recommend the adoption of this site for the statue. Consequently, if the Council accede to the recommendation, one end of the Town Hall will be graced by a statue of Sir Titus Salt, Bart., and the other with the Lister memorial.

Our Office Table.

THE APPOINTMENT OF ARCHITECT TO THE LONDON SCHOOL BOARD.—The number of candidates, originally about forty, were carefully reduced to two, Messrs. Robson and Quilter. The votes for these gentlemen were equally divided, but on the casting vote of the chairman being given, Mr. Robson received the appointment.

ARCHEOLOGICAL DISCOVERIES IN THE PUNJAB. A rich mine of sculptures was discovered last Christmas in the ruins of Takht-i-Bahi (near Hoti-Murdan), on the Punjab frontier, by Dr. Leitner. We (*Academy*) are glad to learn that Government have since dispatched a party of sappers, who are exploring the locality. It is said that there are many other places in the Yusufzai district equally rich in these remains. The statues appeared to Dr. Leitner to be "Græco-Indian and Buddhistic."

AN ANGLO-SAXON CEMETERY.—A discovery, which has promise of being of importance, has just been made by a labourer named Fox, upon the farm occupied by Mr. John Clark, of Acklam. The place is an outlier of chalk, about half way on the slope of the Yorkshire Wolds, upon the property of Lady Vyner. Here a pit was being dug, in which to burn lime, and at a very small depth Fox found the skeletons of five persons laid at full length. Such fragments of the skulls as have been recovered are intended for Dr. Rolleston, at Oxford Museum. There were personal ornaments with the burials of much interest. One had a necklace of beads of glass and pottery, but only four have been preserved. There were two buckles and a clasp in bronze, and a grand gilt circular fibula set with stones, found,

but unfortunately the men did not know their value, and parted with the relics for 4s. The Rev. Canon Greenwell has arranged to make a thorough examination of the cemetery after harvest.

HORTICULTURAL BUILDINGS.—Messrs. Clark & Hope, who have sent us a copy of their horticultural catalogue, have now been well known for nearly half a century as designers and manufacturers of conservatories and similar erections. During that period they have executed in all parts of the kingdom a number of important works to which they refer the public. Among these are the range of horticultural buildings in the Royal Gardens of Frogmore; the pinchouse at Clumber Hall, Worksop, the seat of the Duke of Newcastle; the conservatory erected in the grounds of Eaton Hall, Cheshire, for the Marquis of Westminster; the pinchouse and hot-water apparatus at Packington Hall, Coventry, for the Earl of Aylesford; the conservatory, greenhouses, and hot-water apparatus at Westou Hall, Shifnal, for the Earl of Bradford; the hot-houses and hot-water apparatus at Elvaston Castle, Derbyshire, for the Earl of Harrington; the conservatory and the extensive hot-water apparatus, on the one boiler system, at Walcot, Salop, the seat of Earl Powis; the vineries, conservatory, and forcing-houses at the Grange, Hants, erected for Lord Ashburton; the hot-houses at Penryn Castle, Bangor, for Col. the Hon. E. G. Pennant, M.P.; the hot-water apparatus, on the one boiler system, of the forcing-houses at Gredon Hall, Atherstone, for Sir George Chetwynd, Bart.; the hot-houses at Westwood Park, Droitwich, for Sir J. S. Pakington, Bart., M.P.; the hot-houses and hot-water apparatus at Drayton Manor, Tamworth, for Sir Robert Peel, Bart., M.P.; and many others too numerous to mention.

INSTITUTE OF CIVIL ENGINEERS.

THE Council of the Institution of Civil Engineers have awarded the following premiums for papers read at the meetings during the session just concluded:—(1) A Telford Medal and a Telford Premium in Books, to Bernhard Samuelson, M.P., M. Inst. C.E., for his "Description of Two Blast Furnaces, erected in 1870 at Newport, near Middlesbrough;" (2) a Watt Medal and a Telford Premium in Books, to Jules Gaudard, civil engineer, Lausanne, for his paper on "The Theory and Details of Construction of Metal and Timber Arches;" (3) a Telford Medal and a Telford Premium in Books, to Alexander Beazley, M. Inst. C.E., for his paper on "Phonic Coast Fog Signals;" (4) a Telford Medal and a Telford Premium in Books, to Thomas Dawson Ridley, Assoc. Inst. C.E., for his "Description of the Cofferdams used in the Execution of No. 2 Contract of the Thames Embankment;" (5) a Telford Medal and a Telford Premium in Books, to James Price, M. Inst. C.E., for his paper on "The Testing of Rails, with a Description of the Machine for the Purpose;" (6) a Telford Premium in Books, to Walter Raleigh Browne, Assoc. Inst. C.E., for his paper on "The Strength of Lock Gates;" (7) a Telford Premium in Books, to Sir Francis Charles Knowles, M.A., F.R.S., for his paper on "The Archimedean Screw Propeller, or Helix of Maximum Work;" (8) a Telford Premium in Books, to Hamilton Elia Towle, of New York, for his "Account of the Basin for the Balance Dock, and of the Marine Railways in Connection Therewith, at the Austrian Naval Station of Pola, on the Adriatic;" (9) a Telford Premium in Books, to George Banks Rennie, M. Inst. C.E., for his "Account of Floating Docks, Especially those at Carthage and Ferrol;" (10) a Telford Premium in Books, to Arthur Jacob, B.A., Assoc. Inst. C.E., for his paper on "The Disposal of Town Sewage;" (11) the Maunby Premium of Books to Wilfred Aiky, B.A., Assoc. Inst. C.E., for his paper on "The Archimedean Screw for Raising Water." The Council have likewise awarded the following prizes to students of the Institution:—(1) A Miller Prize to Frederick Harry Mart, Stud. Inst. C.E., for his paper on "Prussian Railways—Their Construction, Cost, and Financial Results;" (2) a Miller Prize to George Gatton Mellish Hardingham, Stud. Inst. C.E., for his paper on "Practical Aeronautics;" (3) a Miller Prize to Arthur Turnour Atchinson, Stud. Inst. C.E., for his paper on "The Theory of Energy and its Application in the Form of Heat to the Steam Engine;" (4) a Miller Prize to Henry Francis Joel, Stud. Inst. C.E., for his paper on "Bricks and Brickwork;" (5) a Miller Prize to Wm. Tweedie, Stud. Inst. C.E., and a Miller Prize to Francis Wilton, Stud. Inst. C.E., for their paper on "The Calculation and Designing of Girders;" (6) a Miller Prize to Henry Oliver Smith, Stud. Inst. C.E., for his paper on "Materials Employed in Sewer Construction;" (7) a Miller Prize to Killingworth William Hedges, Stud. Inst. C.E., for his "Description of the Pumping Machinery Employed at the Works of the Amsterdam Canal."

A few of the magnificent oak trees in Burghley Park having shown symptoms of decay, were recently cut down, and were sold by auction last week. The size of the trees and the value of the timber may be inferred from the prices that were realised. One tree brought £72, a second £61, a third £54, and the whole, 30 in number, realised £900.

Chips.

The church of Shimpling, near Sudbury, has been thoroughly and carefully restored and a new and more powerful organ placed within it. It was reopened on Friday week.

The difficulty about the Crown and Chalice of the Abuna of Abyssinia is at last compromised by the adoption of Mr. Eastwick's suggestion that they should be purchased at a reasonable price and sent back to Abyssinia.

We regret to announce the decease of M. Charles Texier, Gold Medallist, and honorary and corresponding member of the Royal Institute of British Architects.

We have this week to record the death of Mr. John Charlesworth, architect, Manchester. He died on the 23rd of June last, in the thirty-ninth year of his age.

The ruins of Nottingham Castle, which have so long formed the crown of the bold escarpment which overlooks a vast sweep of country to the south of the town, are shortly to be removed, in order that the table land on the top of the rock may be converted into a site for villa residences, of which there will be room for about twenty-five, including lawn and garden space.

The annual dinner of the members and friends of the Architectural Association will take place to-morrow at the Black Horse Hotel, Sidecup.

A new theatre is about to be erected near the Edgware road, of which Mr. Walter Emdeu is to be the architect.

It is stated that Mr. Millais sold his landscape "Chill October," in this year's Academy, to Mr. Agnew for £1,500. Mr. Agnew has resold it to Mr. Mendel, of Manchester, for £2,500.

Mr. Foley, the sculptor, has so far benefited by his sojourn at Hastings, that he will be able to return to London almost immediately.

The last meeting for the season of the Archaeological Institute takes place to-day. Mr. Parker will read a paper on Rome.

A fortnight ago we stated that the meeting of the Kentish Archaeological Society would be held at Sevenoaks on the 3rd of August. We should have said the 2nd and 3rd of August. The *Guardian* states that Mr. Scharf will describe the pictures at Kuole.

The Cathedral of Florence is to be finished at last, the holes being already pierced for the erection of the scaffolding. The design selected is that of Professor Emilio de Fabris.

It is proposed, by a measure of which Mr. Stausfeld has charge, to transfer the sanitary powers at present exercised by the Home Office and the Privy Council to the Poor Law Board, and to change the name of the latter department into that of the Local Government Board.

Mr. R. Slec, the clerk to the S. Olave's (Southward) District Board of Works, is dead.

An interesting paper on "City Parochial Endowments" was read by Sir Charles Trevelyan at a meeting of the Society of Arts on Tuesday evening. The facts adduced by the hon. baronet show the necessity of a sweeping measure of reform in the administration of the funds derivable from such sources.

Timber Trade Review.

PRICES, July 3.—Per Petersburg standard:—Soderham first and second quality mixed yellow, 4 and 2 x 9, £9 5s. to £9 10s.; 3 x 10, £9 10s. to £9 15s.; battens, £8 5s. to £8 10s.; Skelleftea mill-sawn yellow battens, 2½ x 8, £7 15s. to £8; Quebec yellow pine, first bright, 12ft. 3 x 11, £19 10s. to £20; ditto first floated, 12ft. 3 x 11, £17 to £17 5s.; ditto 2nd, £13 10s.; ditto first dry floated, 12ft. 3 x 11, £18 to £18 5s.; ditto second bright, 12ft. 3 x 11, £13 15s. to £14; ditto third bright, 12ft. 3 x 11, £9 5s. to £9 10s.; ditto third dry floated, 12ft. 3 x 11, £9 10s.

Per 120 12ft. 3 x 9:—Trois Pistoles first spruce, 3 x 9, £15 to £15 10s.; 3 x 10, £15; 3 x 8, £13; S. John's first spruce, 3 x 9, £13 10s. to £14; ditto unsorted, 3 x 9, £13 5s. to £13 10s.; Quebec first spruce, 12ft. 2in., £16 10s.; Christiana second white, £19 10s.

Per 120 12ft. 3 x 6½:—Dram second yellow, £6 10s. to £6 15s.; ditto third white, £6; Kragero second yellow, £6 10s. to £6 15s.

Prepared flooring per square:—Freidrickstadt first white, 1in., 7s. 9d. to 8s.; ditto 2in., 8s.; ditto second white, 1in., 7s.; ditto second yellow, 1in., 7s.; ditto second yellow, 1in., 8s. to 9s.; 2in., 7s. 3d.; ditto first yellow, 1in., 10s.; 1½in., 14s.

HULL PRICES.—Per Petersburg standard:—Wyburg red, £10 15s.; Memel second red, £10; Crown Riga white, £8; Quebec best pine, £19 10s.; Holmsund red, £11; ditto second red, £10; spruce, £7 15s.; Uleaborg red, £8 10s.; Omega red, £14; Petersburg red, £13 10s.; ditto white, £9 10s.

Memel Crown staves, £17 per 120.

Timber per load:—Crown, £4; Memel best, £3 15s.; ditto seconds, £3; Dantzig seconds, £2 10s.; Swedish, £2 15s.; Quebec yellow pine, £1 10s.

Timber per cubic foot:—Quebec oak, 2s. 7d.; ditto elm 2s. 3d.; ditto birch, 1s. 10d.; Dalhousie ditto, 1s. 6d.

Trade News.

WAGES MOVEMENT.

THE TYNE STRIKE AND THE BELGIAN JOINERS.—The *Newcastle Chronicle* says:—"On Saturday afternoon six of the joiners lately brought across from Belgium were taken down to the steamship Otter by a number of the joiners now on strike in this town, with a view of forwarding them to their own country. The men had just got on board the vessel amidst the cheering of a large crowd on the quay, when Mr. Robson, secretary to the Masters' Association, put in an appearance with a policeman and three or four assistants, with the intention, it was understood, of arresting certain Belgians who were under contracts. Strict search was made throughout the vessel, amidst great excitement, but the men could not be found. The search was continued up to the last moment of the vessel leaving the quay, and Mr. Robson and his friends, being unable to lay hands upon the parties they wanted, were compelled to come on shore, as the steamer moved away. No sooner had the vessel got into mid-stream than the Belgians appeared on deck, and there were renewed cheers and loud laughter from the spectators. As Mr. Robson was leaving, the spectators hooted and groaned, and a few nutshells were thrown at him by persons in the crowd. A few minutes after the vessel was out of sight a cab drove in hot haste down to the wharf, containing a sergeant of police, an additional officer, and one of the masters. It is hardly necessary to state that it was too late for any further steps to be taken in Newcastle." In connection with the strike, it is stated that a suggestion has been made, and seems likely to be acted upon, for the formation of a Joiners' Co-operative Industrial Society. A number of persons are unable to get their houses completed in consequence of the continuance of the strike, and some of the joiners are prepared to undertake work on their own behalf. The dispute in the trade may therefore lead to the establishment of a successful Industrial Co-operative Society.

DUBLIN.—The Dublin carpenters, to the number of about 500, have been on strike for the last three or four days.

LEEDS.—Six months ago the Leeds joiners and carpenters gave notice to their employers that after June 30 they would require a reduction of the hours of labour to nine per day, an increase of pay from 6½d. to 7d. per hour, and the abolition of piece work. A large meeting of the trades was held on Thursday week, the masters having refused to accede to these terms. It was unanimously resolved to adhere to the demands, and it was decided that three shops should be "drawn" on Saturday if the masters refused to comply. The men remaining at work agreed to subscribe 4s. each per week for all strike hands. On Tuesday all the carpenters and joiners remaining at work received notice to leave on the following day, so that a general lock-out has taken place. 800 men are thus out of employment.

TENDERS.

BASFORD.—For additions to Bank House. R. Scrivener & Son, architects:—
Sutton & Meadon £175 0 0
Barlow 158 12 0

CITY.—For the erection of new offices for the Board of Guardians of the City of London Union at Ratholmew-cloze. Mr. William Hudson, architect, No. 19, Bennett's-hill, E.C. Quantities supplied by Mr. J. W. Forge:—
Palmer & Son £7418
Higgs 6789
Turner & Son 6583
Colls & Son 6471
Brass 6273
Perry, Bros. 6253
Hill, Keddell, & Waldram 6250
Conder 6086
Henshaw 5976
Browne & Robinson 5943
Hill & Sons 5894

HANLEY.—For rebuilding the Jug Inn. R. Scrivener & Son, architects, Hanley and Longton:—
Woodridge (accepted) £1400

HANLEY.—For additions to George-street works. R. Scrivener & Son, architects:—
Barlow £243
Woodridge 240
Harvey & Co. 234
Bowden 228
Bradbury 215

KENT.—For the erection of six cottages at Dymchurch, for A. S. Jones, Esq.:—
Hazzell & Capel £1290 0 0
Prebble 1000 0 0
Lee & Padgham 987 17 0
Brooks & Slade 970 0 0
Adeock & Rees 969 0 0
Holdum 965 0 0
Harnett 922 0 0
Clifford (accepted) 855 0 0
Broad 805 0 0

KENT.—For the erection of two detached cottages at Stelling Minnis. Quantities supplied:—
Brooks & Slade £630 0 0
Cozens, Bros. 628 0 0
Webb & Maycock 611 18 0
Peters 579 0 0
Clifford 502 9 6
Stickels & Boughton (accepted) 460 13 9

KENT.—For converting the Fountain Inn, Ashford, into two substantial shops or residences for G. A. Lewis, Esq. Quantities supplied:—
Dryland & Co. £1100
Steddy, Joy, & Steddy 1075
Clifford (accepted) 1069

LEEK.—For the erection of stables, Dunwood Lodge. R. Scrivener & Son, architects:—
Bowden £575
NEWCASTLE-UNDER-LYME.—For the erection of house for minister. R. Scrivener & Son, architects:—
Sutton & Meadon £615
Barlow 565
Bailey 540

PICCADILLY.—For the erection of stabling, &c., Hamilton-place, for the Metropolitan Board of Works. Quantities supplied by Mr. T. Nixon:—
Nixon & Son £8387
Stimpson 6448
Whitlock 6295
Perry, Bros. 6187
High 5910
Bradwell 5785
Shurmur 4994

PICCADILLY.—For the erection of the Criterion restaurant for Messrs. Spiers & Pond. Mr. Thos. Verity, architect. Quantities by Messrs. Pain & Clark, and Messrs. Welch & Atkinson:—

Contract 1:—
Thompson £10,660
Browne & Robinson 9,460
Henshaw 9,268
Manley & Rogers 8,529
Smith 8,478
Hill, Keddell, & Waldram (accepted) 7,995

PLUMSTEAD.—For the erection of new Infirmary for the Woolwich Union. Messrs. Church & Rickwood, architects. Quantities supplied:—
Whiting £20,790
Kent 20,635
Stiff 19,898
Perry & Co. 18,924
Kirk 18,922
Tongue (accepted) 17,559

SHELTON.—For additions to S. Mark's Schools. R. Scrivener & Son, architects:—

Bennett £725
Bowden 700
Bailey 695
Sutton & Meadon 656
Woodridge 650
Barlow 648
Cook 637

STAFFORD.—For additions to Wyckdon Lodge. R. Scrivener & Son, architects:—

Wood, Bros. £880
Barlow 840

STAFFORDSHIRE.—For the erection of villa at Barlaston. R. Scrivener & Son, architects:—
Sutton & Meadon £1850 0 0
Matthews 1799 0 0
Bailey 1728 15 0
Barlow 1720 0 0
Cook 1645 0 0

STOKE-UPON-TRENT.—For the erection of a pair of semi-detached houses, Trentham-road. R. Scrivener & Son, architects:—

Bennett £828
Bailey 778
Harvey 770
Barlow 738

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Specimens at Museum of Geology, Jernyn-street, Piccadilly, W., and at Architectural Museum, Tufton-street, Westminster.

BANKRUPTS.

TO SURRENDER IN LONDON.

Cookson, John, Plaistow, builder, July 13, at 12.—Chaplin, Thomas, Baltic-place, Lower-road, Rotherhithe, builder, July 18, at 11.

TO SURRENDER IN THE COUNTRY.

Cowell, Joseph, Liverpool, builder, July 13, at Liverpool.
—Carlisle, Robert, Preston, builder, July 17, at Preston.
—Newman, Thomas, Folkestone and Cheriton, builder and brickmaker, July 12, at Canterbury.—Wood, W. R., Surbiton and Southborough, brickmaker, July 13, at Kingston.

PUBLIC EXAMINATIONS.

July 27, W. Fairhead, Tottenham, builder.—August 4, L. Richardson, Shillington, Bedfordshire, builder.—July 14, S. Wrigley, Oldham, builder.—July 11, T. H. Matthew, S. Mawes, Cornwall, builder.

SITTING FOR LAST EXAMINATION.

July 13, E. Mesher, High-street, Fulham, builder.

PARTNERSHIPS DISSOLVED.

Maquade and Knowles, Preston, engineers.—Hague and Robinson, Leeds, builders.—Hall and Goldsmith, Holland-street, Brixton, plumbers.—Evans and Moris, Shrewsbury, plumbers.—Deagley, Brothers, Hartley, Hants, and elsewhere, builders.

SMALL-POX, FEVERS, AND SKIN DISEASES.—The predisposition to is prevented by Lamplough's Pyretic Saline. Agreeable, vitalising, and invigorating, its effects are remarkable in their cure and prevention. Take it as directed. Sold by chemists and the maker, H. Lamplough, 113, Holborn-hill.—[ADVERTISEMENT.]

LATEST PRICES OF MATERIALS USED
IN CONSTRUCTION.

LEAD.			
Pig—Foreign	per ton	£17 15 0	£17 17 6
English W.B.	do	19 15 0	0 0 0
Lead Co.	do	18 10 0	18 15 0
Other brands	do	18 0 0	18 10 0
Sheet Milled	do	18 15 0	19 0 0
Shot, Patent	do	20 10 0	21 0 0
Red or minimum	do	20 10 0	0 0 0
Litharge, W.B.	do	0 0 0	0 0 0
White Dry.	do	25 6 0	26 0 0
ground in oil	do	0 0 0	0 0 0

COPPER.			
British—Cake & Ingot	per ton	73 0 0	74 0 0
Best Selected	do	73 0 0	76 0 0
Sheet	do	76 0 0	79 0 0
Bottoms	do	80 0 0	81 0 0
Australian	do	73 0 0	77 0 0
Spanish Cake	do	0 0 0	0 0 0
Chili Bars, cash	do	65 10 0	67 0 0
Refined Ingot	do	72 0 0	74 0 0
Yellow Metal	per lb.	0 0 6½	0 0 7½

IRON.			
Pig in Scotland, cash	per ton	2 16 9	0 0 0
Welsh Bar, in London	do	7 5 0	7 10 0
Wales	do	6 12 6	6 15 0
Staffordshire	do	7 15 0	8 5 0
Rail, in Wales	do	6 15 0	7 0 0
Sheets, single in London	do	9 5 0	10 5 0
Hoops, first quality	do	8 15 0	9 5 0
Nail Rod	do	7 10 0	7 15 0
Swedish	do	9 15 0	10 0 0

TIMBER.			
Teak	load	12 5 0	13 10 0
Quebec, red pine	do	3 15 0	4 15 0
yellow pine	do	4 5 0	5 5 0
Quebec oak, white	do	6 0 0	6 5 0
birch	do	3 10 0	4 10 0
elm	do	4 0 0	4 10 0
Dantzic oak	do	4 10 0	6 10 0
fir	do	2 7 0	4 0 0
Melmer fir	do	2 10 0	3 10 0
Riga	do	3 5 0	3 10 0
Swedish	do	2 5 0	2 10 0
Masts, Quebec red pine	do	4 0 0	6 10 0
yellow pine	do	4 0 0	6 10 0
Oregon	do	7 0 0	9 0 0
Latwood, Dantzic, fm.	do	3 0 0	5 0 0
St. Petersburg	do	5 5 0	6 15 0
Deals, per C., 12ft. by 3 by 9in.	do	12 10 0	18 0 0
Quebec, white spruce	do	12 10 0	14 10 0
St. John, white spruce	do	12 10 0	14 10 0
Yellow pine, per reduced C	do	13 5 0	14 0 0
Canada, 1st quality	do	18 0 0	19 10 0
2nd do	do	13 5 0	14 0 0
Archangel, yellow	do	12 10 0	14 10 0
St. Petersburg, yellow	do	13 0 0	13 10 0
Finland	do	7 10 0	8 10 0
Memel and Dantzic	do	0 0 0	0 0 0
Gothenburg, yellow	do	8 10 0	10 10 0
white	do	8 10 0	9 10 0
Geffe, yellow	do	10 10 0	12 10 0
Soderham	do	8 10 0	12 0 0
Christiania, per C., 12ft. by 3 by 9in., yellow	do	10 0 0	12 10 0
Other Norway	do	7 0 0	8 0 0
Flooring boards, per square of lin., first yellow	do	0 9 0	0 10 0
First white	do	0 8 0	0 9 0
Second qualities	do	0 6 0	0 8 0

OILS, &c.			
Seal, pale	per tun	34 0 0	35 0 0
Sperm body	do	81 0 0	82 0 0
Cod	do	25 10 0	0 0 0
Whale, South Sea, pale	do	34 0 0	0 0 0
Olive, Gallipoli	do	47 10 0	48 0 0
Cocoonut, Cochiti, tun	do	50 0 0	0 0 0
Palm, fine	do	37 0 0	37 10 0
Linseed	do	32 10 0	0 0 0
Rapeseed, Eng. pale	do	44 10 0	45 0 0
Cottonseed	do	27 0 0	32 0 0

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An ELECTION of PENSIONERS will be held in October next. Forms of application, copies of rules, and any other information may be obtained of any member of the Committee, or by letter of the Secretary.

All applications must be filled up and delivered at the Office, 14, Bedford-row, W.C., on or before the 25th inst.

F. T. MULLETT, Secretary.

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THE BUILDING NEWS.

LONDON, FRIDAY, JULY 14, 1871.

NATIONAL COMPETITION DRAWINGS, SOUTH KENSINGTON.

IN a well-lighted and convenient gallery at the South Kensington Museum we have now again the annual gathering of the Art School work throughout the country—of the drawings and models, in fact, which have been selected by an influential body of examiners to compete for the medals and prizes offered by Government in this great national competition. From a total of some 65,000 works, we have here a collection of about 700 of the most meritorious, and amongst these have been awarded nine gold, twenty-four silver, and sixty-five bronze medals, whilst to 95 other students have been adjudged minor prizes, consisting of books on art subjects. On the occasion of the last competition, when the drawings were exhibited in the Raphael Gallery, we were forced to make several complaints with reference to the arrangement of the works in revolving frames or cases, and we are happy to see that this time the drawings are far more satisfactorily displayed, the majority of them being on screens, while a few only of the less important ones are shown in revolving cases, which are, however, larger and more suitable for the purpose than those we were obliged to find fault with before.

The number of drawings forwarded in competition for the medal in the antique school is, as might be expected, very considerable, and the highest honour in this stage falls to Mr. James Robertson, of the Edinburgh School, for a carefully-finished drawing from the "Cymbal Player," or dancing faun. The shading in this work is very elaborately finished, and differs in this respect from the premiated drawing last year. Silver medals have been awarded to Messrs. W. Alexander, of Salisbury, and J. S. Noble, of the West London School, for studies from the discobolus of Naucadio, and that of Myron. Messrs. H. Beaber, of Salisbury, Tom Hunt, and W. C. Little, of South Kensington, have bronze medals in this stage, in which also ten book prizes have been awarded. Looking at the general character of the works from the antique, we are glad to find that the tendency to stipple and over-elaborate the shading is decidedly less prominent than last year, when we were compelled to blame several works on this score. In stage 8D, chalk shading from life, a silver medal has been most honourably earned by Miss Susan Dacre, of the Manchester School, for a very clever study of a female head. The treatment of this work is most artistic, and the handling is all that could be wished. The same pretty model has, if we mistake not, been sitting to Miss Thompson and Miss Robinson, who have gained book prizes for their life studies in oil.

In the groups from still-life, the competition is so vigorous, and the works produced this year are so meritorious, that the examiners have recommended the award of two medals in this stage on future occasions, namely, one for studies in oil and the other for water-colour drawings. This will do away with the difficulty which now exists of comparing works in these two different mediums. The gold medal here is won by a lady, Miss Rose E. Stanton, of the Stroud School, for a study in water-colours of dead game and foliage. This distinction is well merited; and the exquisite and feathery touch with which the plumage is delineated deserves our highest praise. Three silver medals in this stage have been gained by Messrs. D. Doherty, of Manchester, and Paul Looch, of Hull, for a pigeon and fruit in oils, and a shell and some old Flemish jugs, respectively; while Miss Mary E. Southworth, of the Manchester School—the only

recipient of two silver medals—takes one of them for some beautifully painted grapes in water-colours, the other being for a study from a white convolvulus, stage 14A. Bronze medals for groups in oil have been awarded to Messrs. F. Morris and E. J. Parker, and to Misses M. W. Webb and Lucy M. Poole.

The modelling is a vast improvement upon last year, and besides calling for special comment from the examiners, has resulted in the award of two gold medals. Mr. James Steele, of the Glasgow school, takes one of these for his clever and vigorous work from life, representing Samson bursting asunder the bonds of new cord with which the faithless Delilah has caused him to be bound; while the other falls to Mr. G. F. Munn, of South Kensington, for a model of the Hercules from the antique. The silver medal in this section is obtained by Mr. William Stevenson, of Edinburgh, for his model of Leander; while two ladies from the Female School of Art, Bloomsbury, have gained bronze medals—Miss Julia Pocock for a head, and Miss E. Selous for a female figure. A very graceful and well-designed female figure by Miss Pocock carries off the prize books. Silver medals for modelling have likewise been awarded to Messrs. A. Barlow, of Lambeth, and J. Rowley, of the West London school.

Before passing on to the applied designs, we should notice the drawings from the cast in chalk and sepia, which appear to us to be this year universally excellent. Thus, in class 5B, two students of the Bradford school, Messrs. J. Charnock and J. Crowther, have received silver medals for shaded drawings from the apples and the rosette; and similar awards have been made to Mr. Peter Smart, of Aberdeen, and Miss E. M. Eyles, of the Oxford school, for monochromes in water-colour of ornament from the cast. Of these works the chalk shading of the rosette by Mr. J. Crowther is a marvellously delicate and refined example of stippling, and the sepia drawing of Gothic foliage by Miss Eyles should be attentively studied as an excellent specimen of careful and highly-finished manipulation. The outline drawings of foliage from Nature are not up to the mark, and here we find that two sets of prize books only have been awarded.

We may now pass on to the works in stage 23 (applied designs), among which all the five remaining gold medals have been distributed. Beginning with the architectural drawings, stage 23B, the gold medal is gained by Mr. G. L. Luker, of the St. Martin's school, for a design for a cathedral in that type of French Gothic which is inspired by an ardent admiration for the works of M. Viollet le Duc. The execution in Mr. Luker's case is better than the design, though even in this latter respect the work is far superior to any of the other church designs here exhibited. Mr. Luker has received also a book prize for some well tinted water-colour sketches of the decorations of the remains at Pompeii. The quality of the works in this stage is anything but satisfactory, and the display is certainly inferior in merit to that of last year. A few second-rate designs are contributed by architectural draughtsmen in country offices, and some tamely-executed measured drawings constitute the bulk of the work. Book prizes are awarded to Mr. W. H. Singer, of Frome, for a careful drawing of the north porch of St. Andrew's Church, Wells, and to Mr. G. A. Noble, of Nottingham, for a slashing-drawn perspective view of a church, rudely etched in common writing-ink. From Nottingham also we have a rather weak design for a memorial by Mr. J. Brooke, which is, however, very minutely drawn; a measured work from the chancel of Sandiacre Church, and a church interior by Mr. Noble. Mr. H. C. Harris, of the Cardiff school, has three views of his design for a church—his west elevation is very nicely drawn and carefully worked out. The fault of this design, which is very good in many respects, is in

the fenestration of the tower, the effect of which feature is destroyed by the numerous small openings. Mr. H. Saunders, of South Kensington, has a design for a villa which, from the shape of the window heads, is apparently Gothic. The designs for a town hall from Leicester should surely not have been entered for national competition; perhaps, however, the elaborate borders to the drawings softened the hearts of the examiners. The villa by Mr. W. Watkins, of South Kensington, wants a little more dash and vigour in the pen work.

Passing on to the designs for textiles and lace, Nottingham is again unusually strong, so much so that it has been considered advisable to award two gold medals for lace in this school. Mr. William Butler, whose design carried off the local prize offered by the Mayor of Nottingham, receives one of these for an extremely graceful and pleasing arrangement of primroses and blue bells, which are more conventionally treated than the wild flowers introduced by the other gold medallist, Mr. G. F. Turton, who has, by varying the thickness of his thread, produced the effect of a sort of half tint in portions of the flowers and foliage which is, we think, a very legitimate and agreeable mode of obtaining expression in this material. Another Nottingham student, Mr. T. W. Hammond, has obtained a bronze medal for a lace design; and five students of the same school have gained the prize books in this stage. Miss M. E. Butler, of South Kensington, has carried off the only silver medal for some excellent designs for Brussels, Honiton, and point-lace, while bronze medals go to Miss A. Keeling, of Lambeth, and Miss Badcock, of Taunton. We have also some admirable designs for woven fabrics; thus, Mr. J. H. Park, of Coventry, gains a silver medal; Mr. Nimmo, of Glasgow, has one in bronze; and Messrs. G. Payne, of South Kensington, and Wm. McFadayan, of Glasgow, the prize books for their designs for carpets. Another Glasgow student, Mr. A. Anderson, has received a silver medal for a most gorgeously-coloured and Oriental-looking scarf; while bronze medals for designs for scarf ends and ribbons have been awarded to Messrs. F. Hall and John Sumner, of Macclesfield. The Coventry ribbon designers make a very fair show, though they do not seem to have succeeded in carrying off any of the more important prizes this year. Miss M. Mansell, of South Kensington, has obtained a silver medal for her design for muslin, while Miss M. Brooke, of the same school, has received the prize books. The whole collection of designs for muslins is very interesting and good.

The fourth section of stage 23 has also called for the award of two gold medals. Mr. W. M. Crichton, of Edinburgh, obtains one of these for his delicate and beautiful design for a set of jewellery; he exhibits also a second set scarcely less excellent than that which has carried off the prize. The designs for metal work and jewellery are this year both numerous and good, and the marked improvement in the quality of the work from Birmingham has called for special notice from the examiners. We were ourselves compelled to point out last year some serious defects in the designs from this school, and we are glad to be able to congratulate the master upon his success. Messrs. A. W. Cund and J. R. Duffield have obtained bronze medals for designs for a candlestick and a vase respectively, and Mr. William Ellis, of Sheffield, receives the prize books for a picturesque-looking badge for the Master Cutler. The other gold medal in this section has been awarded to Mr. Owen Gibbons, of South Kensington, for an admirable design for the decoration of a ceiling, which he has evidently prepared in competition for the prize offered by the Plasterers' Company. Another very good design for a ceiling is shown by Mr. Randall, of South Kensington, which receives the silver medal, and must have run Mr. Gibbons very close. Mr. George

Clansen, who obtained a gold medal last year, has this time a silver medal for his design for wrought-iron gates, which evinces a careful and accurate study of the material. We have again three frames of watch-backs from Coventry, very similar in many respects to those of last year. Some cleverly painted tiles from Lambeth and The Potteries are to us a novel feature in the national competition; a charming little baby, painted by Samuel Jenks, of Newcastle-under-Lyme, aged fourteen, has obtained the prize books. There is a good competition for the prize in modelled ornament; the silver medal in this stage falls to Mr. William Wright, of the Hanley school, for a well-designed frieze of lizards, birds, and foliage.

Again this year the ladies hold their own in flower painting. Miss E. Austin, of Bloomsbury, carries off the silver medal for a bunch of the most tempting-looking apples; and bronze medals are awarded to Miss Jackson, of South Kensington, and Miss Cunningham, of Charterhouse, the former for a study of apple blossoms and larch sprigs, and the latter for some fruit. We do not think that much fault need be found with the furniture, as the examiners appear to suppose. Mr. W. S. Hicks, of Newcastle-on-Tyne, has received a bronze medal for a fifteenth century carved oak cabinet with brass hinges, in which the style is admirably maintained throughout; and another student of this school has an unrewarded though excellent design for a cabinet, founded on the precedents furnished by Mr. Talbert or Mr. Moyr Smith. The prize books have been awarded to Mr. C. Emery, of Birmingham, for some capital designs for domestic metal-work. The tile designs are certainly not equal to those of last year. Mr. Jacob, of the West London school, has obtained the prize books for a pattern which savours too much of marquetry or wood inlay. Some good book-covers are sent by Messrs. H. Arnott, S. Reilly, and J. Cockrill. Among the fan designs, that of Miss H. Montalba is justly rewarded with a bronze medal, and the same distinction is gained by Miss S. Prince, of Bradford. The historic ornament does not show much improvement upon last year. Messrs. G. Bailey, of Derby, and G. Hoskyn, of West London, have received bronze medals, and Miss Badcock, of the latter school, the prize books. This work as at present practised seems to us to be very aimless, and can do the student but little good. One of the best unrewarded works in this class is the sheet of fonts by Mr. J. Neale, of Leicester.

As the Department failed this year to indicate a geometric form to be filled up with ornament, the works in this stage are difficult to compare; there is nothing, however, of more than average merit. Miss E. Jackson, of South Kensington, has obtained the silver medal for her analysis of flowers, and Miss H. Golding-Bird, of the same school, has received a bronze medal in this section. The designs for wall paper are an improvement upon last year. Bronze medals are gained by Mr. J. J. Shaw, of South Kensington, and Mr. T. H. A. Pilkington, of Warrington. Some excellent designs by Mr. E. G. Reuter seem to us to have been overlooked by the examiners. A prize offered for pottery designs by Mr. Campbell, of Stoke, does not appear to have elicited a fair amount of response; the best work here is by Miss Major, whose designs for cups and saucers have received a bronze medal. The design for a centre dish by Miss Montalba is also very good.

Among the numerous interesting works here collected, we fear that in this brief notice many have been undeservedly omitted; but we trust that our remarks upon the general main division will be accepted in the spirit in which they are made. The Kensington system of art-training is undoubtedly doing immense good throughout the country; and the mere fact of being able to get together annually such a collection as the present one

shows how vigorous and healthy is the work which is being accomplished. The few faults we have had to find, are, we are sure, more than counterbalanced by the praise we have been able in many instances most justly to bestow, and we trust that next year we shall see an even more extensive collection of the the works of our art-students.

READY-MADE ORNAMENT.

IT would take a long list to contain all the various deformities which centre in that familiar object, a London house; and yet, were they left in their native plainness, they would only be half as repulsive as they are. The decoration is the crowning horror, which doubles all the rest. Could they only recognise their hopeless ugliness, could they only have the modesty to say, "Do not look at us; we cannot help being so," one might pass them rather with sorrow than disgust. But to see such features tricked out in such finery is indeed no pleasant spectacle. The more it is considered, the more wonderful it seems, that people with eyes, and a reputation for being rational, should spend time and money in ornamenting an average street front. Yet, after all, they may plead one extenuating circumstance—the ornament they employ is fit for nothing else. It must either be used where they use it, or thrown away; for the only known class of work which it would not disgrace is our nineteenth century "vernacular." That style, indeed, we, for our own parts, should prefer to see unadorned; and that ornament we should prefer not to see at all. But if they must exist, they are made for each other: by all means let them stand or fall together.

Whatever may be the reason, however, a piece of plain, well-designed construction is one of the rarest things to meet with. In our towns, at least, bad decoration is as all-pervading as bad smells; and, we may add, as little noticed by those who are accustomed to it. If we look down, there are ornamental tiles, ornamental scrapers, ornamental railings from one end of London to the other. Look a little higher, there are ornamental pilasters, ornamental capitals, ornamental cornices, and all the devices of the plasterer. Higher still, there are ornamental slates, ornamental zinc-work, and fearfully-ornamental chimney-pots. Go indoors, and you swim in a sea of ornament. If the eye craves a moment's rest, the whole body must suffer; for it is only to be had by bending painfully back to look at the ceiling. Even in that there is more ornament, as far as quantity goes, than in many a noble church. To modern magnificence, however (of the ready-made description), this is but a trifle. Look at the walls, and find, if you can, a square inch that is plain; they overpower you with magnificence at a halfpenny a yard. And even this is not all, for the splendour of the carpet as far surpasses the splendour of the walls as this eclipses the splendour of the ceiling. Happy age, whose art has outdone that of all the world before! The Greeks, the Italians, the Mediæval French were nowhere in comparison to us; we cannot so much as make a plain stove-front or door-knocker. How can the world ever have called us an inartistic nation?

To whom, then, are we indebted for this astonishing state of things? Not chiefly to our architects, though some of them have their share in it. But the class of houses we have specially in view usually spring up without architects. They rise from the earth, like trees, or rather like toadstools, apparently without design or contrivance on anyone's part. Their builders certainly make no pretence of inventing their decoration; the builder's clerk who drew their plans, with Peter Nicholson to help him, could hardly manage a Corinthian capital; the very plasterer, by the time he has turned out his magnificent acanthus-leaf modillions, sees the last of his available ideas; who did the rest?

If the builder had to design it all, if he even had to pay some one else for designing it, we may shrewdly guess that 99 per cent. of it would be spared us. The secret is, he buys it ready-made. All this ornament costs him no time, no pains, no thought; it is manufactured wholesale, and, like a patent medicine, is supposed to be equally suited to every purpose. This, in fact, is its main characteristic. True architectural ornament is made for its place. Whether it has more or less of positive beauty, it has always enough for its position, and always of the right sort. According to what seems the popular notion of the day, ornament can never be too beautiful; whether its place is to be a high or a low one, it should always be the finest that can be had. We have seen, on this principle, all the works of antiquity ransacked for details with which to cover shops and gin-palaces; and we are still seeing the same process applied to the treasures of the Middle Ages. If there is a capital or a cornice in which, so to speak, was focussed the decoration of a whole cathedral, this is exactly what is seized upon and copied. Still worse, this, or something analogous to it, is what is multiplied and repeated without end by machinery, till the best things which art has ever produced become, through this means, precisely the most trite and wearisome. Thus ready-made ornament not only makes modern buildings more disgusting, but ancient ones comparatively tame and flat. For the sake of both, we must wish for a revival of architecture in our streets. We must hope that the time may return when houses were designed, and not merely decorated. With a higher civilisation, a more thorough national culture, it may be so. The present state of things only gives point to Mr. Carlyle's remark, that "the first spiritual want of a barbarous man is decoration; and this we may still see among the barbarous classes in civilised countries."

VIOLET LE DUC'S "DICTIONNAIRE RAISONNÉ DE L'ARCHITECTURE FRANÇAISE." *

IX.

INTO the history of monastic architecture as developed in France, M. le Duc enters very largely, devoting upwards of fifty pages to its elucidation. The line we have laid down for ourselves in reviewing this great work will, however, preclude our following him so closely here as we have hitherto done. Our aim is rather to instruct the student of the art as a record of the past, and the younger members of the profession who are seeking in it a working future, than to give a merely archaeological *resumé* of the various phases through which that art has passed. Now, although both may find much to learn in the arrangement of the dwelling-places of "the monks of old," and although the conventual buildings of the middle ages had a great influence on the architecture appropriated by the more stirring walks of civil and military life, yet, as we shall have to study that influence in reviewing the consequences effected by it, we must restrain our wish to enter so fully into this branch of the subject as its importance merits and that wish makes us desire.

M. le Duc, like most other commentators on the conventual architecture of the middle ages commences his review of it with the well-known plan of the monastery of S. Gall.

Although this plan, having so frequently been reproduced in works treating upon conventual arrangements, may be well known to many of our readers, yet, for the benefit of those who cannot command such works, we once again republish it (Fig. 22) from M. le Duc's reduction, taken from Mabilon's essay in the "Annales Benedictines." The design is by many assumed to have

* Dictionnaire Raisonné de l'Architecture Française du XI. au XVI. Siècle, par M. VIOLET LE DUC, Architecte du Gouvernement, Inspecteur-Général des Edifices Diocésains. 10 vols.; 8vo.; Morel, Paris, 1854-1868.

emanated from Egin-hard, the secretary, son-in-law, and biographer of Charlemagne; nor is it beyond the range of possibility that our own countryman, that learned Yorkshireman Alcuin, the friend of the great king, had some share in its arrangement. Executed about the year 820, this plan, which is still preserved amongst the archives of the Swiss monastery, bears internal evidence of having been the well-thought-out successor of many previous attempts. The arrangements betoken a long experience in planning, and give evidence that this must be the successor of many a less perfect building. The letters in our footnote will explain the plan, by which it will be seen how cleverly grouped together are all the parts. The abbot's lodgings are contiguous to the schools, and the guest-house on the north side of the church; at the east lie the cemetery, infirmary, the garden, and the house of novices, whilst the monastery proper groups itself round the sunny cloister on the south.*

The risk of destruction by that dread enemy, fire, is reduced by detaching the heating apparatus, probably serving also as a ventilating shaft from the dormitory; the isolation of the latrines from the general buildings. These arrangements show a great advance in sanitary science—an advance evidently the result of former inconveniences. The kitchen separated from the refectory by means of passages, and the general disposition of the buildings, indicate that the faulty combination of these parts in older edifices had been sedulously avoided, so that even at this early period much experience had been brought to bear. That aggregation of men which we have already noticed as forming the chief feature in the social life of the great chieftains of these days, no doubt taught many lessons, and the monastery most probably reproduced and improved upon many of its features. The great hall became the church, and the other arrangements were modified to suit the requirements of those who found in monastic buildings not merely a temporary, but a permanent home—a home which served them from the time when they first entered its walls till that day when within those walls they laid their bodies down in the "Garden of God," beneath the shadow of that church they had passed their life in serving. Once fixed upon, the general arrangements of monasteries varied but little; the life of its inmates was much the same in one century as in the next.

Here or there the nature of the site caused some change, and now and then the wild and troubled condition of the district where they were erected caused these buildings to

partake largely of the nature of a fortress, and the handwriting of War as well as of Peace was written on their walls. Of the skill with which this union was effected we cannot refrain from giving an exemplar in the plans of that extremely interesting edifice, which overlooks the sea, Mont S. Michel, on the Norman coast. Situated on a rock jutting out from a sandy bay not far from Avranches and Pont-orson, it was, when France was freeing herself from Norman and English occupation, a military point of great strategic importance. On this rock, so far back as the eighth century, a body of monks had settled; to dispossess them in those days was a deed too daring for a monarch to think of, yet this point could not be given over entirely to men of prayer, so in the early part of the thirteenth century the union of two such widely different ideas as Peace and War had to be accomplished. Philip Augustus left the rock in the possession of the monks, and built them a new monastery, and his architects managed to produce a building suitable for both the man of prayer and the man of war. If you turn to our illustration (Fig. 23), you will see the general plan of the situation. The summit of the mount is elevated some 200ft. above high-water mark. A narrow rocky strand opens on the south side of this island towards Pont-orson, and then the ground rises very abruptly. Leaving here a narrow landing-place, they placed the first fortified gateway, with a guard-house at C. Passing this we find at D another gateway opening into the small town, defended by walls and towers, and occupied now, as from time immemorial, by those "toilers of the sea" who find a convenient refuge here. Following the tortuous street of this little town, passing its little parish church at O, with its cemetery (T) behind it, and ascending by a long flight of steps, we reach the gateway of the abbey at F, defended by a barbican at E. At B is the cloister, and culminating the hill at A is the church of the patron saint of all high places, the Archangel Michael. Terracing down to the south were the gardens of the monks, and under the church was the fresh water cistern, without which S. Michael's Mount would be merely a man-trap. From the rampart H, a long and very steep staircase, L K, leads down to the shore, by which means direct egress from or access to the monastery and fort could be obtained without making the detour of the town in the rear, and by which a sudden succour in time of need might be obtained. At L, is a fountain of brackish water, good enough for ordinary purposes. On the almost isolated rock M is a small oratory dedicated to S. Hubert; at P is a fortified gateway, giving access to the magazines and stores of the abbey, which are situated at Q, whence the commodities were hoisted by means of the inclined tramway I, to the abbey itself; small cisterns for the collection of water for use of the gardens and stores are situated at S and V; and a windmill for grinding corn, &c., was perched on the corner of the island at R. Such is the general disposition of this triple combination of civil, military, and religious architecture. In Fig. 24 is shown the arrangement of the ground-floor of this castle-abbey, which surrounds the summit of the rock. At A are the first entrances, defended by a rampart, to which access is obtained by a narrow staircase. The gateway itself (a formidable defensive work) is at B; this is crowned by two towers and a hall, of which a detailed plan is given at C. Under this gateway is a steep staircase, which leads to a second enclosure, defended by portcullises and machicolations, and from the hall adjoining, access to the monastery is gained through masked wickets and by narrow, tortuous staircases. Over this hall is another chamber, a plan of which is given at D, and whence, by means of channels in the wall, a warm reception, in the shape of molten lead or boiling water, could be accorded to the unwelcome visitor. Each

person entering the abbey had to deposit his arms in the lower of these two halls, unless he obtained express permission from the prior to carry them with him. At F is situated the refectory for the monks, access to which is only obtained by an easily-defended, narrow passage, and beneath this is a room where the alms of the monastery were distributed to the poor. The refectory for the garrison is at G, provided with a separate staircase leading down to the ramparts; and the prisons—necessary portions of a building of this character in those days—are situated at I and K. Ascending a storey higher, by further devious ways, and by more labyrinthine staircases, the principal floor is reached, of which we give a plan (Fig. 25). Here, at B, are the kitchens and the dormitory of the monks at D. The soldiers are accommodated in the large hall E, and above this is the principal cloister, shown on the general plan. At C is a huge crypt of a later date, being built in the sixteenth century, to support the new choir of the church, then rebuilt; and at F and H are the foundations of the older Norman church foundations, required because the surface of the rock was not wide enough to support the superstructure. The abbot's lodgings, and those of his guests, are disposed at G, and the library of this military and monastic establishment is found at I. Above all this dominates the church itself, of which we give a plan (Fig. 26), gloriously crowning this gigantic granite-built mass, presenting a most imposing effect as it looms out from this sea-fog enshrouded bay, and well deserving the name of "la mervelle," which for centuries has been its local designation.

THE OFFICIAL REPORTS ON THE INTERNATIONAL EXHIBITION.

THE Reports by the gentlemen charged by the Commissioners with the duty of examining and describing the different sections of the present Exhibition, are now beginning to make their appearance. Parts I. and III. of the Fine Art section have just been issued, and the others may be expected to follow very shortly. When so much as this has been said, however, many readers will feel that the subject is a new one, or all but a new one, to them, and it is mainly this circumstance which has induced me to consent to give a short account of the nature and object of these publications, and especially of those which are now ready.

The idea of an official handbook or guide other than a mere catalogue is an old one, and has led, no doubt, to the belief that some descriptive account of the contents of exhibition galleries, if really well done, would be a great aid to their usefulness. If but little were done in this way in the Exhibition of 1851, except by what were called jury reports, a capital example was set when the Sydenham Palace was built, for handbooks to its various fine art courts, now almost forgotten, are among the best manuals of their sort extant. Excellent official guides were drawn up for the Art-Exhibition of Manchester and some of the Continental exhibitions, but the present plan of official reporters was first adopted with regard to the Paris International Exhibition of 1867. A number of qualified experts in various branches of knowledge were sent over to Paris, and requested to report on the objects exhibited, each taking one or more departments. The papers prepared by these gentlemen exist in the form of a blue-book, or, more properly, of half a dozen blue-books; but their existence is probably not known to one person in a hundred even among those who would find them highly valuable for the fund of well-digested information which they contain.

In the present instance, this first of the annual International Exhibitions was to be described, or at least written upon, in a similar manner. About forty reports, by as many different reporters, have been prepared, and

- * A. Choir pointing eastwards.
- B.D. Exhedra; seats of the dignitaries.
- C. Altar of S. Mary and S. Gall.
- E. Stalls for the monks.
- F. Altars.
- G. Fonts.
- H. Second choir at the west end.
- I. Exhedra attached to ditto.
- K. School.
- L. Sacristy.
- M. Scriptorium, with library over.
- N. Staircases.
- O. Narthex.
- P. Vestibule for the inmates of the monastery.
- R. Ditto for schools and refugees.
- S. Refectory.
- T. Cellar, with larder over.
- U. Baths.
- V. Heating apparatus.
- X. Isolated latrines.
- Y. Kitchen.
- Z. Bakehouse for altar bread.
- a. Kitchen garden.
- b. Gardener's house.
- d. Fruit border.
- e. Quarters of the novices and infirm.
- f. Poultry-house.
- g. Doctor's quarters.
- h. Garden for medicinal herbs.
- hi. Pharmacy.
- i. Abbots' lodgings.
- l. Hostelry with stables.
- m. Lodging and stables for servants.
- n. Workshops.
- o. Mills and stores.
- p. Workmen's lodgings.
- q. Orchard-keeper.
- r. Lodgings for pilgrims and the poor.

are in course of publication in ten parts. Of these, four parts, containing sixteen reports, refer to the Fine Art sections of the Exhibition, and sixteen to the Industrial sections. The editor of the whole is Lord Houghton, and without giving the whole list of names it may suffice to say that Part I. contains, Oil Painting, by Sir Coutts Lindsay; Water-colour Painting, by Mr. S. Redgrave; Miscellaneous Painting, by Sir Digby Wyatt; and Mosaics and Stained Glass, by Mr. Gambier Parry. Part II. includes Engravings, by Mr. Julian Marshall; Wood-engravings, by Mr. Gullick; Photography, by Col. S. Wortley; and Architectural Designs, by myself.

The intention of the Commissioners was that the reports should be issued during the continuance of the Exhibition, and that they should be of such a nature as to assist the public to make the most profitable use of it; in fact, that they should assist in educating the public mind and taste. It was, of course difficult—in, fact impossible—for any reporter to write with this object in view without feeling to a certain extent embarrassed by his official position; he could not either praise or blame the works submitted with the same unfettered freedom that an anonymous and unofficial critic enjoys, and he was not able to address himself to a special public. In almost all cases a considerable portion of each report is taken up by general statements of the leading points connected with the special art. This has the double advantage that it gives a more than passing interest to the reports themselves, and that it helps to prepare the way for a sound judgment being formed upon the Exhibition by the public. The writers have all striven, more or less, not so much to express their own opinion upon the merits and demerits of the works of art exhibited, as to show what such works should be in order to be excellent, and here and there to point out an example which bears upon what has been said.

It would be manifestly bad taste in one of the reporters to attempt anything beyond a description of the contents of his own or any other report, but this much may be done with advantage, and without any impropriety; and if it result in causing readers to consult the originals for themselves, I do not think there will be any disappointment felt by those who do so.

Sir Coutts Lindsay devotes four-fifths of his report to a rapid review of the position of the English school of historical and romantic painting, and having compressed his remarks on the landscape art of this country and the oil paintings of the Continent generally into a very small compass, he has found space to review what to most readers is no doubt the most interesting part of his subject pretty fully. Mr. Redgrave, having a far smaller subject, has given a very careful sketch of the rise and history of water-colour painting, and some useful details as to the number and position of works exhibited. It is interesting to notice the divergence of views between these two writers on the subject of body-colour and its introduction into water-colour painting, Sir Coutts Lindsay viewing it with an approbation which Mr. Redgrave evidently does not share, and which I, for one, can hardly fall in with.

Sir Digby Wyatt's subject is a diffuse, and therefore a difficult one. Painted decorations on furniture, on porcelain, and on fans, and enamel paintings had all to be reviewed by him; but his great knowledge of all that belongs to ornamental art comes out well in the report, and though it goes more than the others above-mentioned on the principle of referring to and describing exhibited specimens, it is none the less useful on that account.

Mr. Gambier Parry, with a subject very cognate to his favourite pursuits and studies, has evidently worked earnestly, and with a desire to bring out in the most emphatic

manner the highest principles which underlie all decorative painting. His essay on the subject is fitted in no common degree to instruct those who desire to understand why the best glass and mosaic is good, and why much that seems attractive is thoroughly bad, and should be in the hands of every art student, and its principles in the mind of every art critic.

Mr. Julian Marshall and Mr. Gullick go over common ground in part of their work, and their two papers, taken together, form an excellent account of the nature and history of line-engraving and wood-engraving. Mr. Marshall says very little about lithography; he is, however, more full upon etching, an art too little prized by the general public. If this report has the effect of in any degree drawing attention to the high artistic qualities of good etchings, it will be of service to lovers of art. Mr. Gullick has omitted from his review—very complete in most other respects—of the uses of wood-engraving any notice of its adaptation to the illustration of architecture, yet perhaps no more beautiful employment of the power of the wood-engraver exists than in the illustrations to Viollet le Duc's Dictionary, or the various publications of M. du Caumont.

Colonel Stuart Wortley gives, in a condensed report, notices of the chief improvements which have been lately made in photography, and the Autotype, the Woodbury type, and the Heliotype are well described by him. He also draws attention to the high-class art photographs exhibited, among which any other writer than himself would have had to place his own in the first rank.

Of the report on architectural designs, I can only say that the wish was in a few words to point out the position of architectural design in Europe at the present day, and how it reached that position, and then to give a descriptive account of the principal drawings exhibited, arranging them in classes; and that no pains was spared to make this thorough and complete—with what success others must judge.

T. ROGER SMITH.

REPORT ON ARCHITECTURAL DESIGNS IN THE INTERNATIONAL EXHIBITION OF 1871.*

ARCHITECTURAL designs, especially embodied in perspective views of a pictorial character, as is customary in England, are always seen to disadvantage in an exhibition. In a collection of gallery or cabinet paintings the actual works of art are themselves shown, and if they are only well hung and well lighted, every quality which the artist has been able to impart to them can be appreciated by the spectator. It is the same with such sculpture as is usually sent to exhibitions, for even when a cast, and not the finished statue itself, is exhibited, still the work displays perfectly its composition and modelling, and has received the touch of the artist's hand. But the object of architecture is to design and erect buildings. Buildings are the works of art which an architect produces, and it being impossible for a building itself to be displayed in a gallery, we have to be content with some representation of it, which often falls far short of doing justice to the original.

A perspective view of an architectural design, or of an executed building, bears only so much relation to the actual work of art as a pencil sketch or an engraving would to a statue of which it is a representation, and no more. It is not the building itself; it is only in a limited sense the architect's design for it. It is really only a representation, more or less faithful, of the architectural work as it might be expected to look from a single point of view. Still, when the draughtsman has been skilful and the colourist happy (for it is but rarely that an architect has the leisure, even when he has the requisite command of the pencil and the brush, to execute such drawings with his own hand), these perspective views have the merit of giving, in an approximate way, a fairly good idea of those effects

of outline, mass, colour, light, and shade, which the building will possess; and it has become, in consequence, habitual for the work of English architects to be exhibited in this manner. Continental architects usually prefer to show their buildings by geometrical elevations and plans. These drawings have the advantage that as far as they go they represent the design far more correctly than perspective views. They are necessary to the maturing of the design, and are the means made use of for its execution; but being conventional drawings, they are always more difficult for an untrained eye to understand, and they seldom give so popular or striking a representation of a design as views in perspective afford.

The masses and grouping of a building are sometimes better shown by models, when they are good, than by drawings, and architecture can often be well exhibited by photographic views; but, as just stated, the real works of art produced by the architect are his buildings themselves, and not designs for buildings or views of them, and, consequently, in this or any similar exhibition the fine art of architecture cannot, from the nature of things, be represented so completely as can painting and sculpture. Still, an approach to a display of it, as, for example, in the present collection of drawings, has notwithstanding a great value for the student of this art.

An exhibition of architectural designs has, moreover, a double claim on public notice; first, it to a greater or less extent displays the position of one of the great branches of fine art; and secondly, it indicates the nature, importance, and variety of the many public and private buildings which are rising upon all sides to bear witness to the wealth, the enterprise, and the civilisation of Europe. From this last point of view, an International Exhibition of architectural designs must possess attractions for the political economist, the historian, and the philosopher, as well as for the artist.

In the collection of designs exhibited at Kensington in 1871, the international character of the display is less strongly marked than could be wished, though the disturbed condition of Europe will sufficiently account for this. English architectural drawings, indeed, so largely outnumber those of Continental nations that the collection is virtually an English Exhibition. Viewed as such, it possesses one remarkable feature, due to the relaxation for this year of the usual Exhibition restrictions. It is to a considerable extent retrospective; and we shall find ourselves able, not only to gain a view of the architecture of the day, but to catch glimpses of the course which it has run for the last quarter of a century. An attempt will accordingly be made in this report to furnish the reader with some materials for arriving at an estimate of that course, as well as of the condition of English practice at the present hour. And in the few instances where the Exhibition furnishes the requisite materials, the architecture of other European countries will be compared with that of our town.

Were architecture an art to which certain admitted laws can be applied with absolute precision, as is the case with logic or grammar, or were there such an uniformity of practice and theory as may be supposed to have existed in the great days of Greece, it might be expected that a report intended to help the general public to examine and appreciate the drawings exhibited should take the shape of an authoritative criticism. But though there exist fundamental principles which few deny, the views of those entitled to be heard vary so widely and on so many points, that it is out of the question to attempt to base, on what would be called admitted data, a critical examination of the designs exhibited. All that the reporter can attempt to give is some account of the prominent drawings, &c., divided into groups, and a certain amount of information respecting the most important designs in each group. He is aware that even this cannot be written without it being tinged by his own individual predilections and tastes; but still it has been his endeavour to keep personal views, as far as practicable, in the background, and to report on the designs exhibited with as much impartial fairness as possible.

For the benefit of those to whom the subject is new, it may be advisable to preface an examination of the architecture of the day by such a hasty statement of the course which the art has run in days gone by as may at least help to render the technical terms made use of intelligible, and throw, perhaps, a little light upon its present condition. All, or nearly all, the forms and features assumed by buildings in Europe for a thousand years after the Christian era are modifications of the manner of building practised by the ancient Romans, that manner having itself been a modification of the style which the Greeks had wrought out for themselves.

* We give elsewhere a review by Mr. T. Roger Smith of one division of the official reports of the International Exhibition, and we here reproduce *verbatim* part of that gentleman's report on Architectural Drawings, Designs, and Models. The remainder of the report will appear next week.

The architecture of the Greeks and Romans is commonly known by the general term *Classic*, which has also been applied to their literature. The architecture of early Christendom, at least in Western Europe, is distinguished by the broad term *Romanesque*, a term indicating its Roman origin, and including the well-known Norman architecture of this country. Various influences combined, about the time of the Crusades, to originate a series of great changes, which by degrees revolutionised almost every feature of European architecture; and the style (or more properly group of styles) which then sprang up, and which lasted from the twelfth to the end of the fifteenth century, received the comprehensive name of *Gothic*, but may be more correctly termed *Mediæval*. With the sixteenth century came in that reaction in favour of Greek and Latin literature known as the revival of letters; and it was accompanied by a revival of Roman, but, as it happened, not of Greek architecture. This revived Roman, known most correctly as *Renaissance*, but sometimes termed *Classic architecture*, and not infrequently *Italian*, formed the style of Italy, France, and England, and other European nations; till in England, at the beginning of the present century, and after a long period of inartistic stagnation, a gallant attempt, which met with but a partial and temporary success, was made to revive and introduce Greek architecture. This attempt was followed by a more successful revival of Gothic architecture, contemporaneous with that change in literary taste of which such works as those of Sir Walter Scott were the pioneers, and which to a large extent they helped to bring about; and the Gothic revival is still in full force, but has not superseded the earlier Renaissance or Roman revival.

The periods thus broadly indicated were themselves, it must be understood, times of constant change; and their limits are not strongly marked by definite hard and fast boundary lines, but are nothing else than epochs of more rapid transition. At those epochs the incoming and outgoing sets of ideas are to be seen struggling for possession in men's minds, and the result is what is termed a *Transitional style of architecture*. Nothing, in fact, seems more clear than that architectural style is customarily, if not inevitably, a constantly changing thing; nor is this to be regretted so long as good taste, learning, and skill obtain among the artists who design and execute the monuments of a country.

The names of but few of the *Mediæval* (Gothic) architects have come down to us. The Renaissance architects whose genius most influenced English practice were Inigo Jones and Wren, and among their followers Hawksmoor and Sir William Chambers may be mentioned. With the Greek revival (to which it must not be forgotten we owe some splendid works of art, the chief of which is *S. George's Hall*, at Liverpool), are associated among others the names of Cockerell and Elmes.

The Gothic revival owes a large share of its vitality and success to men still living; but its early impulse was unquestionably mainly given to it by the energy, genius, and industry of Pugin, and the refined taste and indomitable spirit of Barry.

It is not possible, within the brief limits of this report, to trace the course of modern architecture on the continent of Europe. Suffice it to say, that Renaissance art has flourished more or less in every European country; but that English practice has been influenced chiefly by the developments of this style in Italy and in France. In Italy the *Classic* revival was carried out with much purity of taste and refinement of detail; and for long the Italian models were so uniformly followed in England, that by many persons modern revived *Classic architecture* is always termed *Italian*. In France more variety has been introduced into the practice of this phase of art, and many features visible in the designs which make up the present Exhibition are drawn directly from French sources. France, like ourselves, has had a Greek and a Gothic revival within the present century; but, as might have been expected, differences of climate, race, and training have caused Greek art to take a stronger hold there than Gothic. The most compact, well-defined, and altogether powerful architectural school of the present day is that French school whose style, resulting from a fusion of revived Roman with revived Greek, was displayed in all the buildings of the later years of the reign of Napoleon III. To this style the term of *néo-grec* has been sometimes applied.

The present position of architectural art in England does not exhibit much of that compact uniformity of practice which we term a school of art; nor can our architects be fairly said to be at the present moment distinctly divided into two sections, the one practising revived *Classic* and the other revived *Gothic*, as a very few years ago they pro-

fessed to be. Perhaps a fair statement of the actual position of English architecture would be that at the present day revived Greek is abandoned, but that Renaissance is largely practised; that in the most carefully-wrought-out works in this style Italian precedents have been almost exclusively followed, though of late years Renaissance has been largely tinged by features borrowed from France; that Elizabethan and other forms of transitional art have been pretty freely employed in domestic work; but that the most important and most energetic and living architecture of the present day has been and still is Gothic. In the practice of Gothic architecture there has been a gradual but a strongly-marked inclination to go further back in point of time, and wider afield in point of locality in the selection of models to follow; so that, while a building designed by Pugin would have been pretty sure to be in the style of the fifteenth or fourteenth century, and to have been entirely English in every feature and detail, the same work, if undertaken now by an eminent artist of the same class, would be in the style of the thirteenth or twelfth century, and its features would probably be of French rather than English origin.

All this is not living Art; and though the advocates of Gothic may taunt those of *Classic Renaissance* with the want of vitality in their art, most of the Gothic of the day is itself but a vigorous revival of a past style. A strong desire has been naturally felt for something which shall have more of life and growth about it than belongs to the archaeological resurrection of one style after another; and it will be not the least interesting feature of the present Exhibition if we can find that it affords indications of a possible future for English nineteenth century architecture. Now that the elements of architectural art have been well mastered, it seems as though the rise of new wants, such as those originating in railway communication; the introduction of new materials, such as iron and glass, and the revival of disused adjuncts, such as terra-cotta and mosaic, may yet combine, if under good artistic guidance, to render possible the creation of a new, and perhaps a noble, style. If this dream is ever realised, it seems as though some fusion of the peculiarities of Gothic and *Classic* must form its basis. Twice already, in the history of the art, these have blended; once during the long *Romanesque* period when the art of the Roman was by slow changes passing into that of the Goth. Again, and in a different way, this happened in the brief but brilliant time when the revived *Classic* was struggling with the exhausted Gothic; and the style of Francis I. in France, and of Elizabeth in England, were the outgrowth of this combination. Gothic and *Classic* are once more to be found side by side in modern practice. Is it too much to believe that a fusion may again take place, now that a Gothic revival has gone back almost to that point where it touches its round-arched original? The present Exhibition displays one or two designs of importance in which the detail of Gothic is associated with that regular disposition of masses and those bold semi-circular headed openings which seem to have a strong hold upon modern European taste. In this, if in any direction, there seems a hope of a living future architecture.

Meantime our search after novelty has been restless and incessant, and has sometimes led to the introduction into one and the same design of features drawn from the art of various countries, climates, and epochs—a practice which makes great demands upon the skill of the artist who undertakes to harmonise such discordant materials. At other times novelty has been sought for in the introduction of features suggested by individual genius, or not unfrequently by caprice and restlessness. Happily, it has also occurred that our architects have striven—and often with success, as many of these exhibited designs will show—to combine with old forms novel features and modes of treatment growing healthily and naturally out of the materials and circumstances of the day.

GREAT BRITAIN.

The English designs include specimens of most of the architectural styles above referred to as in current use. The Exhibition also comprehends examples of most of the groups into which architectural works may be divided, and so far it may be looked upon as fairly representative; yet in one particular it is far from reflecting the position of architecture in this country. Church architecture is and has been so active, and Gothic art has been so uniformly adopted by the ecclesiastical architects of the day, that the entire absence of certain architects and the comparatively small number of church and cathedral designs exhibited are somewhat misleading. And even among secular works

it is to be doubted whether the large proportion of Renaissance designs exhibited may not serve to convey an idea that *Classical* art is more generally preferred to Gothic than an observant tourist, visiting all our great towns, would find to be the case. This impression is strengthened by the fact that in one or two instances a public building which has been the subject of competition is represented only by some of the unsuccessful Renaissance designs, which are only drawings; while the building itself, which is taking its place among the executed Gothic architectural works of the day, is not represented. The *S. Pancras Terminus* furnishes an instance of this.

In examining the collection, the number of elaborate and expensive drawings prepared for public competitions will strike the visitor. They show with how much energy and ability the great buildings which municipal and other public bodies propose to erect are striven after by competing architects; they also point out how serious is the tax which a public competition imposes upon the time and resources of a rising architect, if he enters the lists determined to put himself on an equality with his rivals; and they raise the question whether all that is good in the undoubtedly stimulating circumstances attending a public competition might not be secured at a less cost to the competitors, and without loss to the public. It is a matter of regret to see works of so much ability hanging on these walls, with the certainty that the large expenditure of labour upon them is destined to remain fruitless. Meantime these designs, though for the most part prepared under conditions similar to those under which designs for actual or intended buildings are prepared, will never exert, in the form of public buildings, a marked influence on the architecture of the age. In some cases they even may have failed through being out of harmony with the spirit of the day, and it seems consequently necessary to class them apart.

The divisions of inquiry will then stand as follows, if placed according to the importance of the drawing exhibited:—

DIVISIONS INTO GROUPS.

1. Civil architecture.
2. Unexecuted designs for civil buildings.
3. Ecclesiastical and collegiate architecture.
4. Domestic architecture.
5. Studies.

In each group an approximation to an alphabetical arrangement of artists' names has been made, though that has been departed from wherever it seemed that any advantage would result from considering two or more designs in connection.

CIVIL ARCHITECTURE.

The designs for civil buildings—a term which will include public buildings and places of business—are much more numerous and important than any others exhibited. The condition of this branch of the art in England a quarter of a century ago is well illustrated by two interesting drawings by Mr. Brakspear (3620, 3655), showing Sir Charles Barry's Palace of Westminster as the design stood in 1843. This national building was at that time being undertaken in the spirit in which it was carried out. All the details were to be strictly in conformity with the best English examples of the architecture selected, and that period was the latest date at which an unmingled style was practised in this country. Sir Charles Barry's unremitting attention was directed to these ends, and to secure them he obtained the personal co-operation of Pugin himself. The minutiae of detail are, of course, not traceable in these drawings; but if we compare them with any recent Gothic design by a good hand, we shall see at a glance how rapidly architecture has moved. The drawings are also interesting as showing what Barry's intentions at that time were with regard to various matters which have been otherwise carried out—e.g., the enclosure of Palace-yard, and the slender and lofty central tower, and the upper part of the Victoria Tower, as shown in the perspective view, differ entirely from the executed building. The best pendant or contrast to these drawings which modern art can furnish, would be the designs, so far as they can be seen, of a building of almost equal national and artistic importance—thenew Law Courts. The competition plans were sent in for this building in the year 1867, and if the successful design of Mr. Street, or that sent in by Mr. Burges, be compared with these drawings of Barry's work, the contrast bears out the truth of what is here advanced as to progress. The most important Gothic civil building actually forming part of the Exhibition, and so available for the purposes of the comparison we have suggested, is, however, the Manchester Town Hall (3743), by Mr. Water-

house, who was successful in a keenly-contested competition. This may be taken as a good example of the Gothic of the day; it possesses a great deal of Continental character and many ornamental features. The great extent of this building cannot be judged of so well from the picturesque drawing exhibited, without any key-plan, as by the mass of some of the unsuccessful designs. Mr. Waterhouse's architecture is less formally arranged than that of several of the more grandiose designs before which his was preferred; and so far as it goes this indicates that public taste in England is not uniformly in favour of that regular disposition of features in a Gothic composition visible throughout Barry's great work, and which is a feature of many of the designs in this Exhibition, and notably of that by Schmidt for the New Town Hall for Vienna, which will be referred to subsequently.

Turning now to other buildings, we come to the contribution of Mr. E. M. Barry, R.A. He exhibits alterations proposed in the Palace of Westminster (3588), which necessarily retain the old architectural character. He also sends a view of his careful restoration of St. Stephen's Crypt (3735), richly decorated in colour. His next contribution of a public character is the best specimen here exhibited of the numerous buildings raised by railway and hotel companies—the Cannon-street Hotel, London (3577). This design is in a rather ornate Renaissance style, with the storeys distinctly marked, decorative chimneys and towers, and the roofs, especially those over the towers, made into important features.

By the same architect is the New National Gallery, as proposed to be erected (3584, 3647). This design was successful in a public competition, and its exterior shows a building in a robust manner of Italian Renaissance, making a free use of columns as decorative features, and in many places uniting two storeys under the one "order." A central dome, and other smaller domes, crown the building. The interior is excellently shown, especially the central hall, which, as proposed here, will be a feature of much architectural importance, and such as is seldom attempted in England. The drawings which embody this design have appended to them valuable key-plans to a small scale; this practice, which Mr. Barry has followed in other cases, doubles the value to professional persons of the exhibited views.

Messrs. Banks and Barry exhibit their Italian Renaissance building, now in progress at Burlington House (3586). There are no traces here of that French influence which is at work on much modern architecture, and the roofs are concealed behind a parapet with a balustrade. Mr. Charles Barry, one of these associated architects, exhibits Alceyn's College, Dulwich (3597, 3601), which has been recently carried out by him. This building is remarkable for the free employment, in its exterior decorative features, of terra-cotta; treated, however, not so much like a plastic material as like an artificial stone. The drawings, if they do not show this peculiarity—as they hardly could—at least show that Mr. Barry has, consistently enough, sought for the models of his architecture in the round-arched style of Lombardy; a country where brick and terra-cotta work was, and still is, extensively practised.

The principal contribution of Mr. David Brandon to the class of civil buildings consists of two elevations of his Junior Carlton Club House (3646, 3652). In showing his building in this manner he has departed, and with advantage, from the general practice of English architects. The Junior Carlton is in Italian Renaissance of that description which, from its depending for its effect chiefly on window-openings, and but little on columns, pilasters, or other such features, is commonly termed "fenestrated." To illustrate the meaning of this term more fully, we may point to Mr. Gibson's Bank at Birmingham (3649), shown, like Mr. Brandon's building, by geometrical elevation. This design is the reverse of fenestrated; it depends for its architectural effect on pilasters and the cornice which surmounts them, and the two storeys of the building are treated as one, for architectural purposes.

It used to be felt that a club-house, almost more than any other building, ought to be of Renaissance architecture, and Mr. Brandon, in the building just referred to, has sympathised with the feeling; but in London a Gothic club-house has been built, and Mr. John P. Jones contributes to this exhibition a view of a Gothic building now erecting at Manchester from his designs, for the Reform Club (3622) of that city. This is a compact block of buildings with visible roofs, a strongly-marked skyline, and both round and pointed arches.

Mr. Somers Clarke exhibits in the General Credit, Lothbury (3759), a Venetian building reproduced with accuracy and spirit in London streets. Venetian Gothic has occasionally been employed in Eng-

land; but when used, better results may be obtained by transplanting it, as in this example, entire, than by attempting to incorporate some of its features with those of another, and, it may be, an unengendered style. In this instance the reproduction has been very faithful, and the character of the architecture has been thoroughly caught in every respect.

Mr. T. Chatfield Clarke exhibits the front of a business house in Throgmorton-street (3618), which, without being an exact reproduction, like the business premises last mentioned, displays many features drawn from Italian Gothic. This may be taken as a specimen of a large amount of work which has been carried out in the reconstruction of places of business in the metropolis within the last few years, though it is not the case that every house which has been rebuilt possesses so much of architectural character as either this example or Mr. Edis's pleasing gabled City warehouse (3624) of French Gothic character, or Mr. Deane's Crown Life Office, Dublin, shown by a photograph.

Mr. H. Curry exhibits a drawing showing a small portion of an eminently representative building—his St. Thomas's Hospital (3636). This is a Classic design of Italian Renaissance character, but with some unusual features on the skyline, which have, no doubt, been forced on the architect by structural necessities. It is to be regretted that of this building, which aims at being the foremost hospital in Europe, and where, of course, far more depends on arrangement and disposition than on architectural treatment, no plans or sections are displayed. The very completeness with which the vast whole has been split up into isolated blocks is as detrimental to the architectural effect of the work as a monument, as it is essential to its sanitary success. To realise this, it is only necessary to contrast this hospital with the not dissimilar building at Netley—a work possessing that very unbroken extent which is here wanting, and gaining from that circumstance an imposing architectural effect, but at the expense of its sanitary reputation. The drawing exhibited, if it shows but a portion of the design, at least displays that portion clearly and well. Buildings for charitable institutions, among which St. Thomas's may well rank as the foremost of the day, are also represented by Mr. H. Dawson's contribution, the London Orphan Asylum (3644), shown by a bird's-eye view, almost as good as a ground-plan in its clear indication of the disposition of the institution. This building was obtained by its architect in public competition, and the design is another illustration of the complexity which modern ideas of separation introduce into the arrangements of public buildings, of course to their disadvantage as works of art. The problem is, moreover, often complicated by the necessity for rigid economy in execution; but that necessity has not existed in the case of the Baroness Burdett Coutt's Columbia Market (3613, 3632, 3762), exhibited by Mr. Darbyshire. To such buildings the Gothic style is very appropriate, but it rarely happens that an opportunity offers for adorning one of them with so elaborate and costly a central hall as is shown in this design. A contrast to the above in extent, yet an excellent example of a very useful and newly-introduced kindred institution, is also exhibited in this gallery in Mr. Butler's Cottage Hospital (3757), a homely but picturesque building.

The two professional advisers of the municipality of London are both represented in this gallery. Mr. Horace Jones, the City architect, sends the Metropolitan Meat Market (3669), an Italian building of more importance than his small drawing of it would imply; he also exhibits in a good drawing a well-known specimen of London street architecture—his Magnetic Telegraph Office (3603), a Renaissance building in a mixed style. The front is full of features suggested by French originals, though not of the most recent type, and the lantern and upper part of the design assume forms which, though irregular, are very picturesque. The recent undertakings of the City of London, in addition to the markets, are illustrated by Mr. W. Haywood, Engineer to the City Commissioners of Sewers, in three drawings, which represent one of the most important civic improvements the Corporation ever attempted. These show Holborn-hill before its alteration (3582), and since the new roadway has been formed (3630), and exhibit also a view of the cast iron and granite viaduct which now carries that roadway over Farringdon-street (3740). The architectural design of the new buildings has in the main a Classic cast, but many of their details are strongly tinged with Gothic feeling—e.g., the angle shafts at the window-openings. The bridge has, to some extent, the same mixed character; but such a bridge as this is a structure fairly exempt from the trammels of precedent. The iron-work (cast-iron) has received a somewhat elaborate decorative treatment. Here, as in many cases, the most important and arduous

part of the architect's task is hardly even hinted at by the drawings exhibited.

Sir James Pennethorne supplies three elevations which, from the circumstances which gave rise to them, form the most interesting series in the Exhibition. These elevations were prepared by him at different periods for the building recently executed for the University of London. Of these designs two are Classic and one Gothic. Sir James originally proposed a Greek design, and the careful line elevation on the left (3654) represents what he desired should be the front of his building. This design approaches nearer to the *néo-grec* of the modern French school than any other English contribution, except one or two students' studies. It is marked by a fine feeling for proportion. The Greek elevation being declined, the architect so altered his design as to admit of the style being changed to Italian Gothic, and its façade, so treated and with a good deal of surface decoration, is shown by a large tinted elevation (3648). This was, however, set aside by a vote of Parliament after the work had been actually commenced, and a third elevation, once more Classic, but Italian in place of Greek, had to be designed and so arranged as to fit the masses of the building as the plans of it then stood. This elevation is the one carried out; it is not so well represented in the exhibited drawing (3651) as the other designs. The whole story is significant; it displays the degree of interference which an architect who undertakes public works in this country must expect to encounter; it illustrates the resource of the artist, and it shows how in actual practice a very difficult problem has been treated by a man of large experience. In connection with this series of elevations a pair of external views exhibited by Mr. Mew (3744) should be examined. They show a competitive design for the Manchester Assize Courts treated in Classic and in Gothic, but retaining the same masses of building in each case, and it is not difficult to see that the architect has felt cramped in his Gothic work by the exigencies of his essentially Classic composition.

3679. Mr. Emerson contributes his market's fountain for Bombay, of vigorous early French Gothic—a design which may be called modern in character, but certainly less removed from what is understood to be orthodox than the design for arch decoration at the Oxford Museum, exhibited by Mr. Pollen (3634). Modern secular Gothic is also represented by Mr. Sorby, who exhibits a view of the Town Hall, Bromley (3580), as built by him. This drawing is a fine specimen of the art of the architectural colourist, and the design is a characteristic example of a modern adaptation of Continental Gothic. The style is somewhat mixed, having features akin to French, to English, and to Flemish Gothic. This is a composition in which the picturesque rather than the regular and formal has been studied. The same may be said of one, perhaps of both the designs exhibited by Mr. Truefitt, who contributes a bank at Altrincham (3609) and another at Manchester (3736), each building being very far removed from the severe dignity of aspect which is conventionally supposed to be proper for a bank. The Altrincham building is a good specimen of the half-timbered English domestic work, of which fine old examples exist in that locality. The Manchester example is more difficult to characterise; it must be classed with the works of those architects who have tried to advance their art by bold experiments, many of which are to be seen in the city where this building is erected. As a contrast to these, we have from Mr. Verity the designs for "The Criterion" Restaurant (3602, 3731), in an orthodox Renaissance manner, but with a good deal of ornament.

Mr. Waterhouse, whose Manchester Town Hall has been already mentioned, also exhibits an exterior view of his Manchester Assize Courts (3657). This is a Gothic design, strongly tinged with Continental elements, and its exhibition in the Paris International Exhibition of 1867 procured for the architect one of the principal medals. The general mass of this building has the regularity resulting from symmetrical disposition, yet a fair amount of picturesque irregularity occurs in parts of the work. The courts were erected a few years ago, and being very extensive and conspicuous, have probably exerted considerable influence both on the formation of public taste and on the practice of architects in the North of England.

The same architect exhibits the exterior and part of the interior of the Natural History Museum (3616, 3673), to be built at South Kensington, immediately adjoining and south of the International Exhibition. This building formed the subject of a competition, in which the late Captain Fowke was successful. After his death the work was placed by Government in the hands of Mr. Waterhouse. Photographs of Captain Fowke's drawings hang at

the south-west staircase, near the refreshment-rooms, and on comparing them with this drawing, it will be seen that Mr. Waterhouse has entirely recast the building. This design is in a round-arched style, approaching Gothic, and well adapted, on account of the small blocks which can be used in its construction, for execution in brick and terra-cotta; it contains the hopeful sign that, though not eccentric or "Victorian," it can be assigned to no exact architectural type. The disposition of the building has all the regularity and symmetry of an Italian Classic design; it is laid out in equal massive bays, with towers surmounted by domes, but the domes are pointed, and the treatment throughout is more Gothic than Classic; the storeys are strongly marked and the highest storey is an arcade. The interior view of the hall, though in many respects less studied than the exterior, points in the same direction: it displays large columns in pairs, carrying an arcade of semi-circular arches, and recalls something of the manner of Mr. Gilbert Scott's design for an Albert Memorial Hall, which we shall reach presently. Altogether, this work, especially when looked at as what an architect actively engaged on large public works proposes to carry out, is the most hopeful and encouraging design exhibited. It hints at an architecture of the future, based upon the features of the past, yet not bound slavishly to repeat its traditions, and it leads to the hope that a building which has for years been desired may, when actually begun, exercise a salutary influence on the taste of the day. The design has not before been publicly exhibited.

Mr. J. W. Wild exhibits the exterior of the East London Museum (3706b), now in progress at Bethnal-green; a brick building, the style of which has been perhaps suggested by French *néo-grec*, but is at once modern, practical, and the outcome of a good common-sense use of brickwork. This building has, we believe, an iron and glass roof, and the design is one suited to such a structure.

(To be continued.)

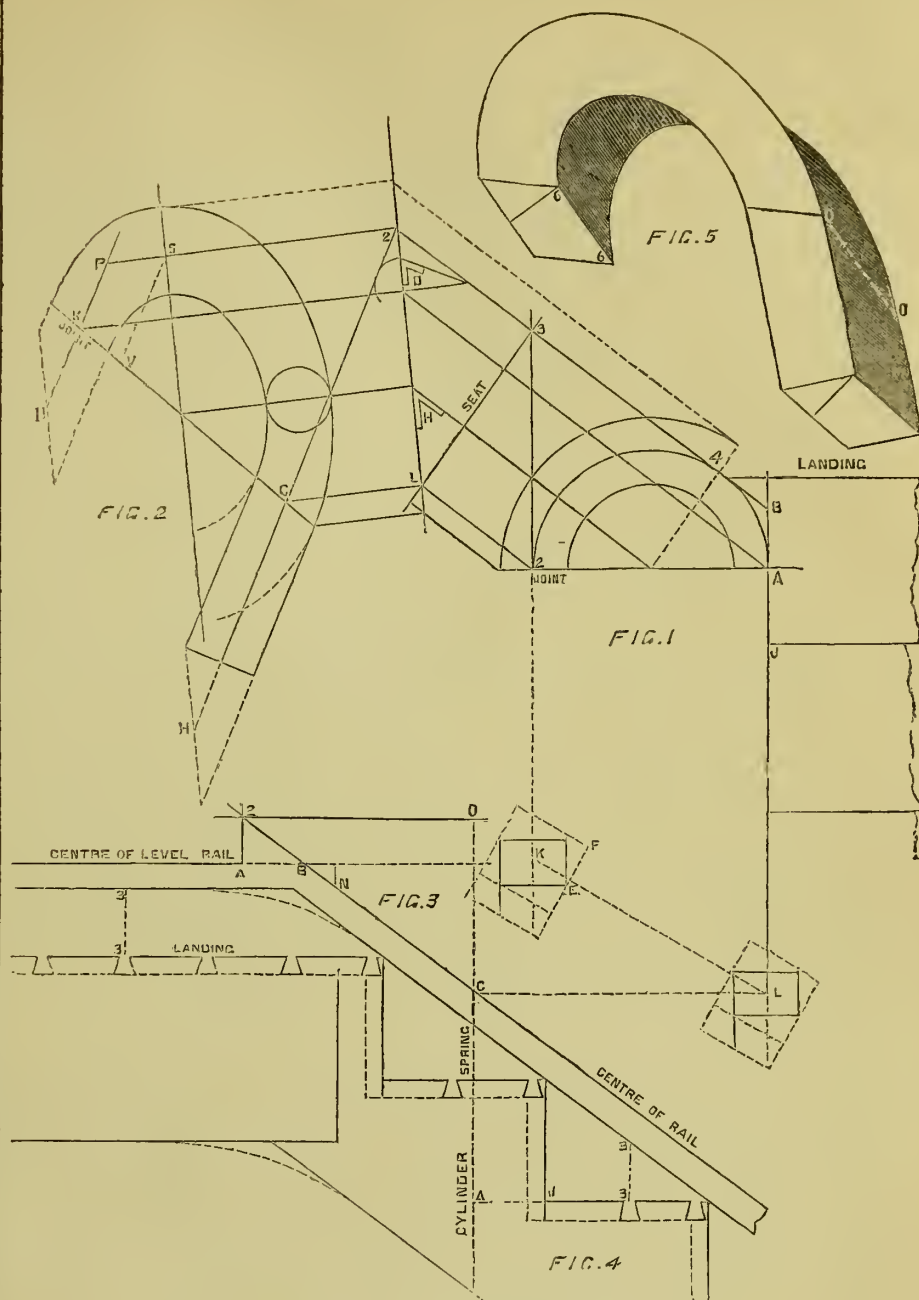
ORNAMENT.

MR. W. G. HERDMAN, in a letter on this subject says:—"From evidence which could be produced, it does not appear that any progress has been made in this useful science for 3,000 years. Ornament, perhaps more than any subject of human progress, waits for classification and intellectual expression. Capabilities of mind in form, somewhat like what Nature gives us in the animate and inanimate life of the universe, are quietly resting in the bud, for coming minds to expand into full-blown richness. It will be that development which will leave no thought or sentiment of the soul unrepresented; that representation will have a unity or harmony with the purpose for which the building, object, or manufacture is intended. For instance, the solemnity of the religious Gothic (I make a distinction between this and civil Gothic) supplies the thought of massiveness and allowed impressiveness, necessary for church and mausoleum ornament, and the misfortune or bad taste of surrounding a raised edifice or cemetery with fairy forms, which would have been more appropriate round a toy manufactory, is obvious.

The distinctions or divisions of the subject seem self-evident. There is the ornament of the human form and the superior animals, so largely and exquisitely given in the ancient temples of Nimroud and the Kouyunjik. There is also an almost infinite source in the inferior animate forms of Nature, richly referred to by the Babylonian sculptors, such as fishes, trees, feathers, weeds, and numerous examples of the fauna and flora of creation. There is also the most general resorts of artists and decorators' efforts, the form of line, without reference to anything in Nature, such as the Alhambra, and Vihara, and the Hylas of Ellora. Again, one of the greatest mysteries of the science is, that those are often the most beautiful patterns where there is no pattern at all. Turkey carpets and Indian shawls are often extremely rich in this singular principle. It may be described as a multifarious and almost infinite variety of indefiniteness; Nature gives it us in many instances, as in marble, the grainings of wood, &c.

It may seem paradoxical when I state that order, precision, and definiteness are the weakest points of ornament, as they are of painting, poetry, music, and the drama. The stars would not be half so beautiful or interesting set in order in rows of lines or squares; it is their apparent confusion which causes that ceaseless wonder which has its foundation in mystery.

When will a Turner arise in the science, who will point the way to intellect instead of the square and rule?



NEW ELEMENTS OF HAND-RAILING.—PLATE XXXVII.

NEW ELEMENTS OF HAND-RAILING.*

(Continued from page 11.)

PLATE 37.—CONSTRUCTION OF WREATH WITHOUT A JOINT, TO GO AROUND A SEMICIRCLE AND FORM ITS OWN RAMP AND EASING—DIAMETER OF CYLINDER NOT LIMITED.

A SOLID wreath without a joint may be successfully applied over winders landing on a level floor. Its lower part forms a perfect ramp; the straight shank thrown on the pitch of square steps. The upper part falls level, and forms the easing on landing.

It will, however, be understood that a wreath without a joint cannot be produced from plank of same thickness as if made in two pieces; yet the additional material, to have it in the solid, is so trifling as to be scarcely worth mentioning. Especially when we come to consider the time saved in making joints, and the superior finish and effect of the work.

Still, I do not advocate the general adoption of this—workmen will exercise their own judgment in the matter.

It may be stated that a solid wreath can be produced from plank of a thickness equal to width of rail. But the joints in that case have to be made on the spring line; which is very objectionable, and at best but a shabby and make-shift affair. Therefore, it should not be adopted.

*This series of articles is a reproduction of ROBERT RIDGELL's work on the subject, published in Philadelphia, and by Trübner and Co., London.

We will now proceed with the explanation of the drawings:

Fig. 1 shows the rail on the left, going up the stairs. It lands on a level floor.

The distance from centre to centre of baluster on line A 2 is thirteen inches. Draw the tangent from 3. Let 2 . 3 equal 2 A. Draw 3 . 4 touching the circle and cutting at B. Then 3 . 4 is the ordinate, and equal with 3 . 2.

The position of riser landing and height of wreath must now be obtained, by making the elevation of one or two square steps, shown at Fig. 3.

Let under side of rail rest on the corners. Set off under side of level rail to suit long baluster on square step. Next, set off half thickness of rake and level rail intersecting at B. Let B A equal corresponding letters on plan. Square up from A, cutting rake at 2. Make O 2 equal A 2 on plan. Next, drop from O the dotted line, giving spring and distance A J. Transfer this to plan, and draw riser J. Set off a step to land.

We are now ready to produce the mould at Fig. 1 by drawing lines from A 2 and centre, parallel with 3 . 4. Make the seat parallel with 3 . 4. Let 3 . 2, the height, equal that of O C, Fig. 3. Join 2 L extended both ways. This is the pitch. Square over the lines. Let 2 P equal 3 B. Make L C equal L 2. Join 2 C extended. Next, draw P K parallel with 2 C. Join C K. This gives the joint on the landing. Let 2 S equal 3 . 4. Draw from S parallel with 2 L. This gives major axis.

Now prove the drawing. The line 2 C, to be correct, must equal that of corresponding letters at Fig. 3. Again, P K must equal that of B 2.

This being all right, find the points to insert pins; then strike the mould with a string.

A word or two on the application of this mould:

First, observe joint K. This, when in position, ranges with joint 2 on plan. The line K P is on the surface of stuff; it stands on the pitch of stairs. Then, the joint K being plumb, the slab K P is cut off square with it, and falls to a level. Observe Fig. 5.

The slab is shown on upper surface.

It is now clear that a square cannot be applied to this joint. Then the best method to prepare the mould is to draw the lines H H parallel with major axis. Lay it on the stuff. Mark and cut square through. This being done, have the edge through H H square with surface.

The next consideration: We cannot work through half the thickness of stuff, the same as for any other wreath. Because, the additional thickness required is on the lower surface; and the slab cut off of the upper, as Fig. 5 shows.

This is further illustrated below Fig. 1, as line L K shows the pitch across the cylinder, it being equal to C K, Fig. 2. The corners of square sections are fair with upper surface of plank, and show the additional thickness of stuff on lower surface.

This understood, set gauge to F E. Run it on the edge; then square over H H. Next, let the bevel H pass through intersection on the edge. Now, lay the mould on. Let H H stand opposite bevel lines.

Mark the stuff along the edges of mould. Adopt the same application for the under side. The bevel D applies to joint on shank. Bevel H also gives it, although a very different angle to that of D; yet both bevells produce the same result on the shank.

ON THE HISTORICAL DEVELOPMENT OF ORNAMENTAL ART.

DR. G. G. ZERFFI delivered the thirty-eighth lecture of this course in the Lecture Theatre, South Kensington Museum, on Tuesday afternoon last. Commencing with Italian art, the lecturer said that during the fifteenth, sixteenth, and seventeenth centuries, Italy had been divided into independent principalities. The rulers of these states had availed themselves of the services of art to lend lustre to their names, and their desire to leave behind them some monument which might render them immortal had produced buildings like the Certosa at Pavia, and the Dome of Milan. The Italian artist, unlike his German brethren, had been bold, proud of his genius, and conscious of his dignity. He had ventured to be original, and though less accurate technically, had possessed greater freedom in composition. He had not hesitated to deviate from the beaten track, and at this period had succeeded in blending the products of Classic art with modern conceptions. The great master of Italy had generally been both an architect, a sculptor, and a painter, and had therefore known what spaces were intended for decoration, and had carried out these decorations with plastic understanding. He (the lecturer) had in his former course dwelt on the different schools of painting, and would now draw attention to English and Italian sculpture. In England during the fourteenth and fifteenth centuries the action of a foreign influence was clearly to be perceived. This was evident in the portal of the Cathedral of York, in the Charterhouse at Rochester, and in the few royal statues remaining in the Cathedral at Lichfield. The capitals of the Cathedral of Ely (1343) appeared to be an exception, as they were executed in an original and thoroughly English style, which was sharp and excellent. As examples of this style, an exquisite Madonna with the Child, on the principal portal of Wells Cathedral, and a statue of S. Mary Magdalene at Magdalen College, Oxford, might be mentioned. The expression in these works, as also the execution of the drapery, entitled them to rank with the very best productions of France and Germany. A deterioration of style in works executed towards the middle of the fourteenth century was to be observed. There was a cold sobriety and stiff correctness in the façade of Lincoln Cathedral, particularly striking in the statues of the Norman kings (1377). The coronation of the Virgin on the portal of Exeter Cathedral was to be preferred, the style being far better. In the execution of tombs, the pictorial element had prevailed. A tomb at Hawton, in Nottinghamshire, representing Christ and the three Marys kneeling, surrounded by four sleeping warriors, was an example of this. The execution of the four latter figures was inferior. Engraved bronze plates had subsequently been imported from the Netherlands, and largely used. Gold and colours had been used in conjunction with the marble, in order to produce a heightened ornamental

effect. The execution of the figures, however, was not satisfactory. The dress was heavy, armour being substituted for the mail-shirt, and the forms were clumsy. Not only knights, but kings, bishops, and ladies, were represented by these monotonous strait-laced images. The figure of Edward III. (1377) on his tomb at Westminster was an example of this. As exceptions, the face of the Black Prince in the statue at Canterbury Cathedral, and the statues of Sir Thomas Arderne and his wife (1391) in the church at Elford, Staffordshire, might be quoted. The tomb of Richard of Beauchamp (d. 1439, at Rouen), at Warwick, was worthy of mention. It had been commenced in 1442, and finished in 1465. The coppersmith Thomas Stevyns had engraved the plate; William Austen, of London, had executed the statue; the chiselling and gilding had been the work of Bartholomew Lambespring, a Netherlander, and John Bourd had made the sarcophagus. The head of the statue was so well executed that it might be compared with the best portraits of Van Eyck. Passing now to Italian works, the lecturer said that the great progressive movement had been inaugurated by Nicola Pisano with his work representing the Descent from the Cross on the portal of the cathedral at Lucca, and the celebrated pulpit for the Baptistery at Pisa (1260). The pulpit rested on six columns and a seventh in the middle. The base of the centre column was formed of three male figures, of which one was nude, and one in a Roman toga, then three animals—a lion, a griffin, and a dog. Having enumerated many other examples in this style, the lecturer said it was necessary to glance for a moment at the artistic productions of the so-called trading community of Venice. It was true that Venice had been devoted to trade; but it must be remembered that the commercial element was not hostile to art. It was hostile, however, when the making of large profits in speculations and horse-racing was more congenial to the taste of the nation than good pictures, sumptuous dwellings, and elegant objects of art. The great services rendered to art by Italy had been fostered by the trading communities of the Republics of that country. The Ducal palace at Venice was an excellent specimen of the Italian transition from Gothic to Renaissance. We now reached modern times. We should find that the enthusiastic spirit of inquiry in science would have that beneficial influence on art which till then had been exercised by the spirit of faith in religion. Nature had been a sealed book, securely fastened by credulity and superstition. Man had not been conscious of the fact that he had neglected the dynamic force in directing all his energies to the static element in the garb of religion. This state of ignorance could not have lasted for ever. Nature had reacted on the stereotyped traditions, and art during the whole of the fifteenth century had striven to find new forms and new solutions to old questions. Whilst in the North of Europe the Reformation had sought to regenerate society by means of a purer religion, in the South this regeneration had been attempted by the influence of art. Architecture had begun to borrow its lines from Classic temples, and artists had learnt to model from Nature. Tombs, pulpits and other works bore the marks of the study of the antique. Erasmus, of Rotterdam, had revived the study of the Greek language and literature, and Nicola Pisano, Donatello, Brunellesco, Jacopo della Quercia, and Ghiberti, had introduced the study of Greek forms, Roman decorations, and Classical motives. The acanthus, honeysuckle, and palm-leaf, the fret and the guilloche, had again appeared, and consoles, spandrels, and friezes had received unusual attention. The old heathen divinities had been revived. The Classical past had again become reality; the marvellous works of ancient days had been brought into connection with the present. Humanity had stepped from its gloomy isolation, had greeted with breathless rapture the bright dawn of modern times. Architecture had provided immense flats, framed in with excellent lines, leaving room for splendid uninterrupted friezes; niches which were to be provided with statues; panels for the reception of arabesques; and pediments and portals to be decorated with mosaics, sculptures, or paintings. The art of painting, the most Christian of all arts, had begun to develop itself. This development generally took place when plastic art had reached a certain climax. Without a correct study of plastic forms, no good painting, no really perfect decoration of flats, was possible. The artist who would take his models for flower-patterns from a herbarium, and not from Nature, would produce Chinese-like decorations. A panel full of good reliefs would serve the ornamentist in his endeavours to fill up a flat surface. To despise the study of the antique and of Nature must lead to a kind of mechanical art,

which certainly could not compete with higher ornamental artists, who had been taught to be, above all, universalists, before they devoted themselves to some speciality. The Italian artists at this period more than ever followed out this rule. The artist had been well versed in literature and science; he had not thought lightly of history, and had cultivated his imagination as well as his technical skill. As soon as the Italians, who must be considered the real creators of the Renaissance style, had begun to treat art from this higher point of view, all stiffness of forms had disappeared, and their products were full of delicacy. What ornamental art at such a period might do could be best studied in the decoration of the Certosa at Pavia. The marble façade had been commenced in 1473. More than thirty artists had tried their skill at the decoration of the church, the cloisters, and the monastery. Amadeo, Andrea Fusina, Alberto da Carrara, and Christoforo Solari had been amongst them. The reliefs were of a more finished workmanship. Capitals and spandrels, archivolt and panels were ornamented with the utmost grace. The stiff coarseness of drapery had vanished—the human form with all its beauty was visible again through the transparent robes—these forms might be said to be spirits in stone. Whilst Italy had reached an art of her own, England had had to borrow her artists from the Continent. England had been engaged at that period in fighting for the highest boon of humanity—individual freedom—and had had little time to attend to the less practical creations of art. Whilst Hans Holbein had to paint, Pietro Torrigiano—the same who had disfigured Michael Angelo for life—had introduced the Renaissance style into England. The best work of this artist was the tomb of Henry VII. and his wife. How by degrees a genuine English art had grown out of foreign motives would be seen in the next lecture, as also what directions art had taken in France as well as in Germany.

ON THE USE OF HYDRAULIC MORTAR.*

By ADOLPHE OTT.

On the Preparation of the Mixture.

IN preparing hydraulic mortar, it is advisable to begin in mixing the dry lime or cement-powder with clean sand. When these form a thorough mixture, the requisite quantity of water must be gradually added under constant stirring up of the material. In no other way can a uniformly and evenly-mixed mortar be obtained with rapidly-binding lime or cement; while if the lime or cement is first mixed with water, a partial binding and consequent clogging of the materials takes place, which either precludes the possibility of a perfect and satisfactory mixture of the sand then added, or renders it at least extremely difficult.

It is self understood that the water must be clean, that is to say, free from all such substances as may interfere with the adhesion of the particles, like clay, mud, grease, and mucilaginous matter.

The mixture of water ought to be such as to secure a product of the most even consistency; this is no doubt obtained with less difficulty and more chance of success through the use of mortar-machines. If, however, the mixture has to be made by handwork, careful and reliable persons ought to be chosen for the work, which should be paid for by the day or week, and not given out under contract.

It is of especial importance not to make the mortar too soft, because, as we have already repeatedly shown, and as has been proved by numerous experiments, the quality and solidity of the mortar is directly dependent on the quantity of water it contains at the moment of its hardening.

While very good Portland cement, for instance, requires only 30 parts in weight of water for every 100 parts in weight of cement to produce a mortar of sufficient consistency, there are other descriptions which must be mixed with at least 40 parts of water; but as in either case the quantity of water chemically bound is almost precisely the same, and as the surplus water evaporates in course of time, it is evident that the density and solidity of the former cement must be far greater than that of the latter.

With very good Portland cement, however, the disadvantage of an excessive admixture of water is averted, in a great measure, in consequence of its specific weight and its peculiar powder-like form, which cause its speedy settling towards the bottom, and its effectual separation from the surplus water; but another inconvenience frequently arises in the

* Translated from "Die Hydraulischen Mortel" of Dr. W. Michaelis, for the Journal of the Franklin Institute.

separation of the mortar-mass, inasmuch as the coarser particles settle near the bottom, while the finer ones remain nearer to the surface. Whenever other descriptions of hydraulic lime or quickly-hardening cement are used, the quantity of water to be admixed must be most carefully measured, or its due proportion ascertained by previous repeated experiments.

An especially careful preparation is necessary for pozzuolana mortars, because with them all reactions are expected to take place after the mixture has been completed.

The mixture of hydrate of lime and pozzuolana must be as dense and thorough as possible.

The pozzuolana ought to be reduced to very fine powder, and the mixture with the lime must be as effective and intimate as possible.

The use of a machine like Hertel's combined clay-cutting apparatus is most commendable for this purpose; because the greatest possible density and uniformity of the mixture is thus obtained.

The preference must, in all instances, be given to the employment of machine power, because it is impossible to obtain a satisfactory mixture by hand-work in any other way than through a plentiful use of water. The result of this excessive admixture of water, however, is a soft, pap-like substance, which can never be made into a dense and solid mortar. It shrinks speedily, gets cracky, and yet remains slack. In cases where pozzuolana mortar is to be exposed to the influence of the turbulent sea, and where its strength and solidity is therefore most severely tried, the greatest care in its preparation is advisable. Nothing which may tend to increase its durability ought to be overlooked. In looking over the numerous directions given for the preparation of such mortar, it is surprising to see the wide difference of the several methods recommended, and the proportionately small quantity of lime almost universally advocated.

The former circumstance finds its explanation in the different descriptions of pozzuolana, or in the local peculiarities and influences of the places where it is found, or where it is to be used; and it is even advisable to experiment with regard to the various proportions of material to be used, in order to ascertain how to attain the most favourable result in any special case.

The second point, however, is worthy of a more minute consideration. In defining the hardening process of pozzuolana mortar, we have already made the remark that a great portion of the pozzuolana remains ineffective, in consequence of the relatively small quantity of lime used in its preparation.

This limited use of lime we explain in the following manner:—

Whenever there is a great surplus quantity of pozzuolana the lime finds a sufficient quantity of easily accessible and binding substances, as silicic acid, alumina, &c.; in a short while the quicklime is thus almost completely converted into hardening compounds, and the consistence of the mortar is likewise secured in a comparatively small lapse of time.

But if, on the contrary, pozzuolana mortar is mixed with a quantity of lime capable of securing the only possible hydraulicity of this lime, a very large proportion of this base would, for a long time, remain in the substance as quicklime; during this period the power of resistance as well as the density of the mortar would be materially impaired, while under water, through the agency of such an easily soluble substance; and it would take a long time before such mortar could resist the influence of water.

It is better, therefore, to renounce such proportion of the hydraulicity faculty as would only become effective after a long lapse of time in all cases where water-mortar is to be made with pozzuolana for immediate use.

It is, however, undoubtedly advisable to take a greater proportion of lime, and to allow more time, in order that the various substances of which the mixture may be composed can have full chance to act upon one another before the mortar is brought into use.

In so doing, the following advantages are secured:—

- (1) The chemical reactions will be more complete.
- (2) In consequence of the more uniform course of these reactions the substance becomes more dense, and the consistence of the mortar, subsequent to the hardening process, is more safely secured.

After the pozzuolana has been reduced to the finest powder, it is mixed with lime, which must be previously reduced to a stiff, pap-like condition; to these materials a sufficient quantity of water has to be added to produce a mass of a certain consistence.

The use of Hertel's clay-cutting apparatus or a similar machine is advisable. After leaving the substance alone for a few days, the mixing process has to be repeated several times with the addition of the requisite quantity of water.

CEMENT FLOORS.

A CORRESPONDENT of the *Country Gentleman* gives the following practical directions for laying cement floors:—"My mode is as follows:—I prepare a box 5ft. long, 3ft. wide, two sides, and one end 12in. wide, and one end 6in. wide, pile of gravel on one side, barrels of tar on the other side, and a large pot to keep tar hot. I place sufficient gravel in box, and add tar hot, sufficient to heat all the gravel by mixing; then place it on the floor, and roll until 2in. thickness is evenly laid over the floor. Then it should stand a day or two; but if pressed to complete the work, commence by putting two shovelfuls of coarse gravel to one of pure cement, until you put as much in box of this proportion as you can mix cement. Then thoroughly mix gravel and cement before adding one drop of water; then add water and mix to usual consistency of mortar—a little stiff is better. Then place the batch on floor, and continue with same mixture, which is thick enough, until one half-inch of surface. You will then find the stone has disappeared, and cement soft on top. Then take one shovelful of cement and one of clean sharp sand, mix, and coat the floor over. If it continues soft, add dry cement sifted over the top, and work in with a plasterer's trowel, which will render it hard, smooth, and as firm as freestone, and good for a century. Any good farm-hand can put it down if gravel is convenient, and, if cement is worth 1dol. 50c. to 2dol. per barrel, a floor can be laid at half the cost of wood, and worth infinitely more. Of the same mixture, one-half and two-thirds, I make all my drain-pipes from kitchen, rain-spouts, bathroom, and water-closets, from one-half to four inches in diameter, and by a process of continuous length and size of pipe. It is common now to find our farmers provided with barrels of gas-tar, and use it freely in warring against rats. In my experience, there is nothing like it for rats."

THE HOUSE CISTERN.

PEOPLE, says the *Globe*, have a very inadequate notion of the extreme nastiness of the regulation house cistern. The uncleanness of drinking water supplied through a vessel which is only shovelled and mopped out about once in three years stands confessed. The deposit accumulated on the floor of the cistern is violently stirred by the rushing stream from the supply pipe almost every time it comes in. Consumers complain that the water is "turbid" for some hours afterwards, and attribute the defect to the quality of the supply. The cistern is forgotten. Whatever impurities there may be in the water are concentrated, and so far as living organic substances are concerned, multiplied, by its being passed through this foul receptacle. Hence the discrepancy between the results of an analysis of the water used by the household and that taken from the mains of the company. The latter is bad enough, the former inconceivably worse. But all these results of the detention of the supply on its way to the consumers sink into insignificance when compared with the evils which ensue from the additional contamination which the water receives from without while it lies in the cistern. It is known, or ought to be, how standing water attracts and absorbs the impurities of the atmosphere which is brought into contact with its surface. Old-fashioned housewives, reasoning from experience, recommend that shallow pans of water should be placed in the neighbourhood of a sick-room, or in an apartment where the air is vitiated by the smell of new paint or any other noxious vapour. The water absorbs the particles of the impure materials floating in the atmosphere, as well as gives off its own substance by evaporation, to mix with the supernatant air and bring down its solid ingredients.

If anyone were gravely to propose the use of house-cisterns for the first time in 1871, and to propound the construction and mode of placing them commonly adopted, he would not be likely to receive a very complimentary reception. We can easily fancy a few of the hard facts which might be pressed upon the consideration of his common sense. Engineers, architects, builders, doctors, sanitary commissioners, nuisance-inspectors, would do their best to place the matter as distinctly as possible before the consumer, and if the latter did not at once indict the authors of the house-cistern movement for conspiracy to poison him, it would not be because the evidence

of skilled witnesses was wanting to support the charge. As matters now stand, however, these authorities only whisper the truths within their knowledge, or state them publicly under pressure. The reasons of this anomalous behaviour are two. First, the water companies are under the strange delusion that a constant supply is more wasteful than the practice of serving out a limited quantity of water at a time, and the landlords, who regard with apprehension the probability of being called upon to spend money on their property, oppose the movement for cistern abolition with the usual pocket argument and principle. The fears of both water companies and householders are entirely groundless. That the system of direct and constant supply is not wasteful is proved by lengthened and extensive experience in the provincial towns where it has been so long adopted. Taps do not break down or pipes burst. Such events are never heard of, and servants and housekeepers do not leave taps running, because if they did, the damage done to their own property, and the work and trouble entailed, would be a heavy penalty for the neglect. For the absurd fears and crotchets of old-fashioned gentlemen with obsolete minds, who apprehend danger to their pictures and articles of *vertu*, we have no consideration. A dash of common sense, or five minutes' conversation with men of their own class in places where the direct-service system has been in use for years, would effectually dispel their hallucination. As a matter of fact, however, such objections are really nothing more than the cover for a director's or large shareholder's reluctance to sanction a change in the manner of conducting a lucrative business. It is the expression of that *inertia* which pervades railway, gas, and water companies indifferently. The morbid dread of the landlords may be at once dispelled by the assurance that the first cost of doing away with house cisterns will be covered by the sale of the old material, so persistently have these perverse people adhered to the practice of poisoning the public with metallic cisterns. Those who have substituted an innocuous material will probably have to draw on the reward offered by conscience for deeds of goodness and honesty for a small balance on the wrong side of the account. As for repairs consequent on the anticipated bursting of pipes and taps, any insurance company may make a safe addition to its revenue by guaranteeing nervous proprietors against such contingencies, albeit with the certainty that the second year's premiums will not be forthcoming. In short, there are no valid objections to the summary extermination of that thing of prey and horrors, the house-cistern, and the substitution of a direct supply as free from impurities as the water companies can find it in their hearts and consistent with their love of dividends to furnish it.

CAST IRON DOOR AND WINDOW HEADS.

WE have from time to time devoted considerable attention and space to the use of cast iron in architecture, and illustrated examples of it as executed in America. We have had usually to point to these as showing what should be avoided rather than imitated as regards design. There are, however, two such great advantages connected with the use of cast iron as a building material—viz., cheapness, and the ease with which it can be worked—that we are glad to notice that the matter is being taken in hand by an English firm. Messrs. Newton, Chambers, & Co., of the Thorncliffe Ironworks, near Sheffield—the scene of the great conflict between the ironworkers and their employers, which was happily terminated about this time last year—have published sheets of illustrations of the various forms of door and window heads which they manufacture. For an ordinary 2ft. 9in. door or window, a door head can be supplied for 5s., and the price of a really ornamental circular door opening is only a sovereign. The door and window heads are sent out complete and ready for fixing, with two coats of paint on back and front, to prevent rusting. All the builder has to do is to apply another coat of paint as near stone colour as possible, and dredge them over while wet with dry Calais sand. A very large measure of support is, we think, likely to reward the spirited manner in which Messrs. Newton, Chambers, & Co. have gone into the matter.

COLUMBIA MARKET.—The Corporation will soon take possession of this market, the understanding being that they are not pledged to maintain it as a fish market. In the event of any differences between the Corporation and the Baroness Burdett-Coutts, the Prime Minister for the time being is to settle them.

DESIGN FOR A GALLERIED CHURCH.

OUR illustration, which is enlarged from a view in Mr. Cubitt's "Church Design for Congregations," shows the internal treatment of a plan proposed some time since for a Nonconformist Church in the North of London. It commenced with a wide nave, divided by stone columns from narrow aisles, which simply served as passages to the seats; it was then widened by two shallow transepts, and ended in an apsidal chancel. An octagonal lantern tower rested on the arches at the crossing; a gallery occupied each transept, and another one the front part of the nave. The gallery fronts were of stone, their arches resting on small shafts of granite or some similar material; and these shafts were the only ones throughout the building which could at all interfere with the view of the pulpit from the seats. All the main columns (eight in number, and of large size) were so placed as to cause no obstruction whatever. The total number of sittings was 1,250—850 on the ground floor, and the remainder above. An entrance porch (20ft. by 10ft.) occupied part of the space under the end gallery, and lessened its projection over the lower pews. Externally, the principal feature was the central tower; the transept roofs, as usual, were gabled; a clerestory, four bays in length, divided the nave from the aisles; and above the windows of the latter was a continuous arcade, pierced to light the connecting passages of the three galleries. The special aim of the arrangement was to produce, without having recourse to iron columns and flimsy construction, a building in which the whole congregation could see and hear the service, differing from the ordinary Anglican Church in not having a multitude of the seats obstructed by the nave piers, and from the ordinary Nonconformist one in not becoming, through its wide roof and spindling columns, a hopeless subject for architectural treatment.

THE NEW LAW COURTS.

MR. JAMES FERGUSSON has published the following remarks upon the above subject:—As not one brick has yet been laid of the New Law Courts, it may not, perhaps, be even now too late to reiterate a protest against the great central vaulted hall, which is part of the design, and which if executed will, I believe, be the greatest architectural mistake perpetrated in our days. In the first place, it is not Gothic in any true sense of the term. No Gothic hall, on anything like the same scale, and applied to civil purposes, was ever vaulted during the Middle Ages in any part of Europe. So far, at least, as my knowledge extends, this is absolutely true. Churches were vaulted, no doubt, but they always stood free, and the thickness of wall and the depth of buttress necessary to sustain the vault were in no sense inconvenient, while they improved most materially the architectural effect. The case, however, is widely different when the vaulted apartment is stuck down in the centre of a number of offices where every inch of space is valuable, and where the building cannot be seen from the outside. Had an architect been employed to design these courts in the thirteenth century, he would most probably have occupied the central space by an open court—perhaps he might have provided a cloister round it; but our hardy forefathers would hardly have asked for even this. Could we call up a real Gothic architect from his grave, he certainly would have roofed this court over, out of respect to the more delicate constitutions and effeminate habits of the present day; but as certainly he would have done it so as to obstruct the light and the free circulation of air to the smallest possible extent. An imperforate, gloomy, solid vault is the very last expedient that could have occurred to his mind. A second objection is the intolerable amount of inconvenience this vault entails on other parts of the building. Where you have vaults of this extent, you must have buttresses; and where buttresses, unless the building stands free, you must have small courts between them. In the plans adopted and published, 1868 and 1869, the great hall was surrounded by twenty-six small courts, 10ft. wide by 20ft. in length and 40ft. deep. Into these consultation-rooms, refreshment-room, and other offices looked, with a blank wall in front of them towering some 60ft. higher. In the plans now adopted, but to which the public have not access, it is understood the worst features of these courts have been "ameliorated." But the fact cannot be got over that a great building like this, in the centre of the City of London, honeycombed with small courts, must be inconvenient, expensive, and most unwholesome. Had the building been erected as proposed in 1868, I believe the Sanitary Commissioners would have ordered the hall to be pulled down at whatever cost; and if the vault is

to remain, I do not see how the present one can be much better. But so few people can realise what is only shown in a plan, and of these so few will take the trouble to do so, that no one seems to be aware of what is about to be perpetrated. A third objection is the expense. When it was my business to do so, I took considerable pains to try and realise what additional expense was entailed by this vault. It is very difficult to do so, and could not be done accurately without taking the quantities cut from a set of drawings from which the vault was omitted. But taking the expense of the vault itself, the extra thickness of the walls, the buttresses, the loss of space, the lining the walls of the twenty-six small courts with stone or tiles, and other incidental expenses, I calculated that the extra expense entailed by this inconvenient anachronism was something between £50,000 and £100,000. I got a glance the other day at the present design for the Strand front of the new buildings. It contains a good deal of beautiful detail, as was sure to be the case from a master of Gothic detail such as Mr. Street undoubtedly is. But I have no hesitation in saying it is the meanest design for the principal front of so important and pretentious a building which has been proposed in our day. The excuse for this, no doubt, is that the expense of the whole has been so cut down that there are no funds available for a larger or more imposing façade. Exactly so; but if Mr. Street insists on wasting £50,000 to £100,000 on a useless internal vault, he has no reason to complain that he has not funds enough to dignify his external fronts. The truth of the matter is, nobody wants this vault except Mr. Street. The public do not want it, as the hall is not to be a thoroughfare, and few consequently will see it, and the few who are there on business will have something else to think of. On the other hand, everyone will see the Strand front, and it will be either an ornament or a disfigurement to our metropolis. The lawyers do not want the vault. They want light and air above all things. They do not want to be stifled in dark, close consultation-rooms, nor to breathe the pestilential air of a deep dank well-hole when taking a slight refreshment. The Treasury do not want it, for they do not want to spend more money than they can help. But notwithstanding all this, it probably will be executed. Mr. Street is not only a man of great ability, but he has a very strong will of his own, and unless some one as clever and as strong as himself, and in Parliament or some position to command attention, will take it up, he will certainly force his crotchets on his unwilling clients in spite of their wishes or interests. When it is too late to remedy it, every one will, no doubt, be clever enough to discover the enormous blunder that has been committed. But this will be but a very small consolation to ourselves, and still less to all future generations of lawyers, and who will live to mourn over the ignorance and apathy of the men of the nineteenth century who allowed such an absurdity to be perpetrated.

ON LIGHT RAILWAYS.

A PAPER on the above subject was read before the Civil and Mechanical Engineers' Society on Friday, 30th June, by Mr. W. Lawford, M. Inst. C. E., who stated that the subject of light railways had for some time past occupied the attention of engineers and others, and was one well worthy of being considered in all its aspects, whether looked upon from a commercial or an engineering point of view. For branch lines, as feeders to main lines, they would doubtless prove valuable adjuncts to the existing system of the country, especially in those districts where the natural features of the land would otherwise require expensive works. It is a well-known fact that many of the old constructed branch lines in this country are suckers from, rather than feeders to, the parent lines. One important feature in connection with light railways must not be lost sight of—viz., that it would be impossible to carry on them a large and rapid passenger traffic, such as is now the case with the main lines of the country; a large and rapid traffic means heavy engines, heavy rails, &c., but for an omnibus and light goods traffic a light railway, with light permanent way materials, light engines, &c., might be made with great advantage, not only to the travelling community, but also to shareholders.

The author did not enter into the question of gauge, but for the present purpose assumed the 4ft. 8½in., or narrow gauge, to be the practical gauge of the country, and he wished it to be clearly understood that by the term "light railways," was meant branch lines from existing main or trunk lines to districts where the traffic was still undeveloped; constructed, however, in a thoroughly substantial and permanent manner, with all the parts made

sufficiently strong to carry a maximum load of five tons on each pair of wheels.

With regard to the cost of light railways generally, he thought that from £3,000 to £3,500 per mile, according to the nature of the country would be sufficient for a single line of railway (4ft. 8½in. gauge) and works, exclusive of the cost of land, and that, with light weights, low speeds (and this must be insisted upon), and flexible rolling stock, the first cost of construction, and that most important item, the cost of maintenance as compared with ordinary railways, might be materially reduced; he further stated that the question of sharp curves and steep gradients entered largely into the present subject, but he thought that it would not be denied that a line with steep gradients and sharp curves, constructed at a moderate first cost, would give a lower final result in working expenses (taking into account the saving of interest on capital) than a line made at a heavy cost with easy gradients and large curves.

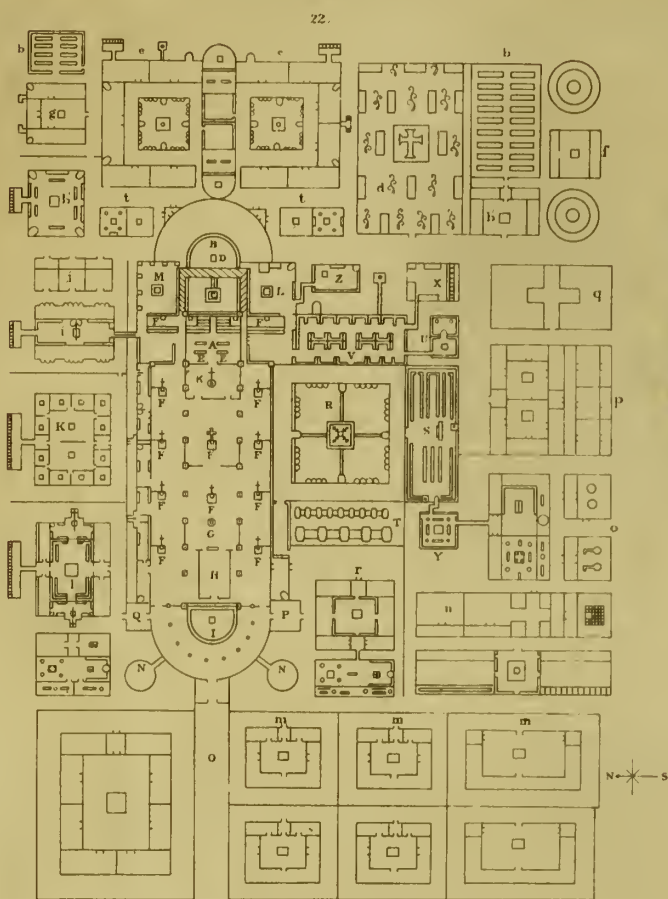
Railway accommodation was almost as much an essential to this country as air and water. It might have answered the purpose of certain localities that they should enjoy railways, and that others should be deprived of them; but the experience of the past had taught wisdom, and whereas in former years, landowners and others used their utmost exertions to drive railways from them, they were now raising their voices to have them brought to their very doors. Expensive tunnels, high embankments, deep cuttings, magnificent viaducts, palatial stations, &c., were not required, nor should the light railways be laid out with the view of leaving to posterity monuments of engineering skill and extravagance; but all the latest improvements and inventions should be adopted, by means of which even a district of hills and valleys might be supplied with railway accommodation at a comparatively moderate cost, and there was no doubt that, in many instances, the lines would be made by the landowners themselves, and others locally interested, who would, of course, be opposed to all unnecessary expenditure.

The author then gave a description of a short line of "light railway" which his firm had lately constructed for His Grace the Duke of Buckingham and Chandos, by means of which the Duke's estates at Wotton are brought into connection with the Aylesbury and Buckingham Railway at Quainton. This line (4ft. 8½in. gauge) is six miles in length, with a branch of one mile and a half. It is, throughout, eminently a line of light works, and with few exceptions, a surface line, the highest embankment being 12ft., and the deepest cutting 10ft. There are no road bridges, the turnpike and other roads being crossed on the level. The rails are bridge rails, weighing 30lb. per yard, and are secured on to longitudinal creosoted timbers 6in. by 6in., by means of fang bolts; there are transoms 4in. by 4in., at every 12ft., kept in their places by a wrought iron tie rod ¾in. diameter. The ballast is 10ft. wide, and is 6in. to 9in. thick under the bottom of the timbers; the line is only partially fenced, the existing hedges being utilised for that purpose. The main line starts from the Quainton station of the Aylesbury and Buckingham Railway, crosses the Aylesbury and Bicester turnpike road, about one mile to the west of Waddesdon, passes through Westcott and Wotton, and terminates at a point near the road leading from Wotton to Brill. The sharpest curve is ten chains radius (excepting that at the junction of the branch line, which is eight chains radius), and the steepest gradient 1 in 60. Nearly four miles of the line have been in use since the early part of this year, and in the month of March alone more than 3,200 tons were carried over it; the line is at present being worked by horses. The estimate for the works was £1,400 per mile, exclusive of the cost of land, and the author did not think that amount would be exceeded. It must be remembered that there were no Parliamentary expenses incurred on this line; that the works throughout are light; that all the roads are crossed with level crossings; and that (with the exception of laying the permanent way, and points and crossings) the works have been executed without the intervention of a contractor.

HARRIS'S PATENT LOCKS.—The latch bolt, an important part of the lock in offices and dwelling-houses, has not received that attention which has been bestowed with such advantage by our great locksmiths on the other parts. Mr. William Harris, of Birmingham, has directed our attention to some improvements made by him in this particular, of considerable value. The principal advantage resulting therefrom is the great addition obtained to the life of the lock, no small gain in the case of a door likely to be violently slammed a hundred times in the course of a day—like that, for instance, which closes our publishing-office.

PLANS.

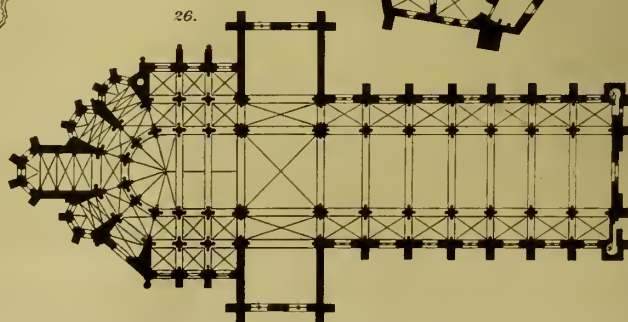
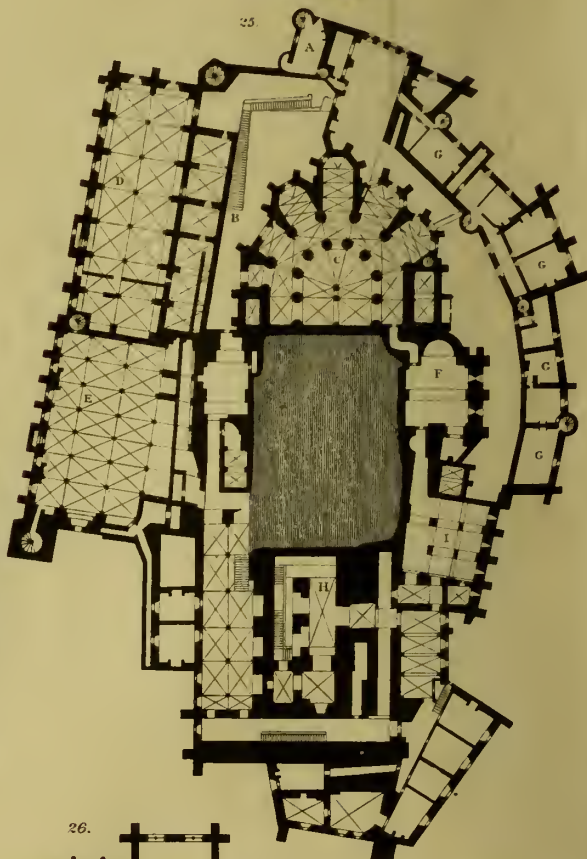
FROM VIOLET-LE-DUC,
'DICTIONNAIRE RAISONNÉ L'ARCHITECTURE.'



PLAN OF THE ABBEY OF SAINT GALL.



GENERAL PLAN OF MONT SAINT MICHEL.



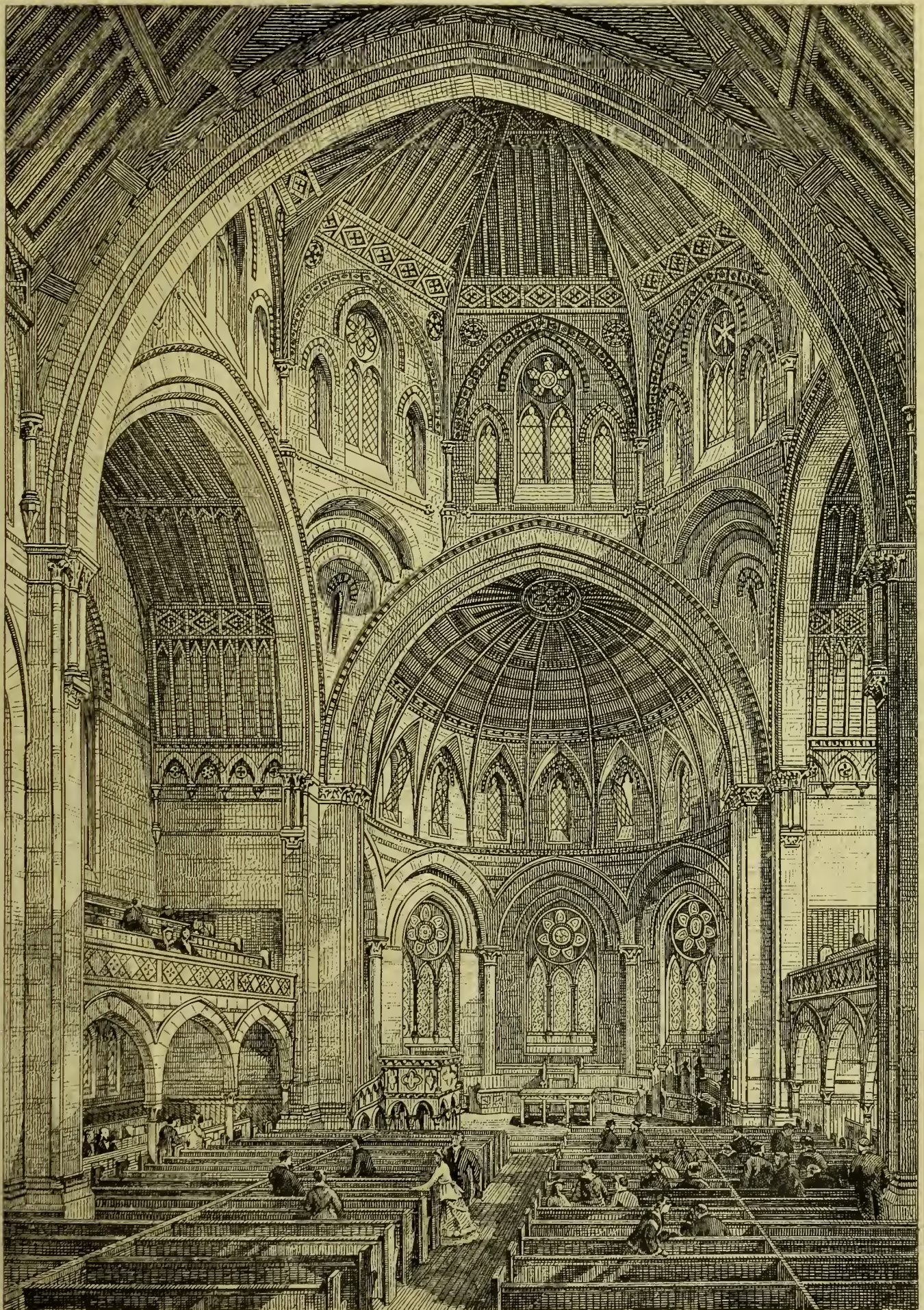


Photo-Lithographed by Whiteman & Bass London

DESIGN FOR GALLERIED CHURCH,

INTERIOR VIEW.

OLD LONDON, AND HOW TO IMPROVE IT.

LONDON might be improved, not by the pulling down of any more blocks of dingy streets or houses, or by the building up of any more prison-like model lodging-houses, and certainly not by the short and painful process of turning into the open street whole families of people to find a home elsewhere, and in more thickly-crowded places; but by the simple plan of adding some comforts to the interiors, and external character—i.e., architectural character—to the dingy and worn streets of London as they are; selecting, of course, if the matter be one of gift, the very worst that can be found. No one, certainly, can go through any one of the ordinary streets of this monster town without being struck with their utter baldness, and at the absence in them of artistic and architectural interest; and at the same time the idea must occur to him at how small a cost of money and material and labour such streets might be improved, and rendered in some measure baldly-interesting, if not artistic. We say again and again that but little, very little, suffices to do this; and in proof of it we would venture to instance those few houses, sometimes groups of them, yet to be found, wherein the purely constructive features of house building have been taken advantage of. In one particular street, an especial favourite with us—and it is truly wonderful it has not been “improved” from off the face of great London—Harrow-street or alley, Houndsditch, a wonderful amount of even architectural, if not painter’s interest has been given to it by the overhanging roof, or lean-to over the shop windows and doors, and projecting shop-board beneath. We specially notice it from the fact of its rarity, and from the fact, still more strange, of the amount of what may be truly termed “architecturesque” power to be got out of so very simple a contrivance. Nothing can be more picturesque than this little narrow way or street almost out of the ordinary London world as it is, and no one can go through it without a painful feeling—that is, if he have any painter’s feeling in him—of how far things artistic are on the wrong road, and how far apart are, at present, the painter and the architect. We notice it, too, as before said, to remind those who may be concerned in any way in the real improvement of London city, at how small a cost art-interest, affording pleasure to the eye, and through the eye to the mind, may be got. No one, we take it, will or can doubt this who will be at the pains to contrast this “poor” street, for poor it is, with some of the new and improved houses and rows of houses but just erected in this very locality—houses of the same size, be it observed, and intended for the same sort of occupiers, and small tradesmen. It is a remarkable instance of how much may be done with a paucity of means.

In the attempts, therefore, now being so strenuously made to improve London, and to better the condition of those who are compelled all their lives long to live in it, it is well to urge on those who shall be privileged to do the work that no great displays of “architecture” are absolutely essential to success in the work, and that, after all, perhaps the real and abiding interest in common street architecture is to be sought in its general picturesqueness or power of producing in the mind of the looker-on the same impressions as are made by a picture on canvas, and that this picture-power should be steadily aimed at in the building of new streets, and in the equally important “improvement” of old ones. No power of philanthropy or desire to do good to the working classes of London could, as it seems to us, be more happily employed even with half a million of money, than in the effort to give to London, or the workman’s quarter of it, a picturesque interest of its own, to make

the open street way a living and real picture. It may be secondary to interior comfort and convenience, but most surely secondary only to that. It is but the administering to the mind’s eye as well as the body’s good, and, indeed, to both the one and the other at the same time.

C. B. A.

ALBERTIA.—II.

THE extent of land purchased by the Commissioners of the '51 Exhibition, in partnership with the Government, for the purpose of carrying out their grand scheme of “providing a common centre of union for the various departments of science and art connected with industrial education,” amounted to about eighty-six acres, costing in all £280,000. Of this sum about £100,000 was contributed by the Government; but in 1858, this joint land speculation having turned out a good thing, inasmuch as the estate had already acquired a large improved value, with every prospect of further improvement, the Commissioners adopted the course of paying back the money advanced by Government, less the value (improved) of the ground and buildings of the South Kensington Museum, which had been erected in the meantime. The Commissioners being thus left to themselves in their newly-acquired estate, continued the business of dealing in the land for building purposes, until, as we said in our last article, they had reduced the estate created with such high and useful destinies to the narrow compass now occupied by the Royal Horticultural Gardens and their immediate surroundings. The Horticultural Gardens, which are about 20 acres in extent, were given over to the Society for thirty-one years, on condition of their expending £50,000 in improvements, against £50,000 to be laid out by the Commissioners in erecting arcades in the Italian style, and in other ways. A large pleasure garden can hardly be said to have direct relations with any of “the various departments of science and art connected with industrial education,” and therefore the space of ground so devoted to the Horticultural Society must be considered a further misappropriation of the Commissioners’ land from the purposes for which it was avowedly purchased. This horticultural movement, however, was a favourite hobby of the late Prince Consort’s, and that ought to be considered sufficient by those who confine themselves to strictly carrying out, in the largest as in the minutest particulars, the intentions of that good and great Prince, whose views upon this particular subject are explicitly set forth in his speech delivered in reply to the address presented by Dr. Lindley, the Secretary of the Horticultural Society, in 1858. Speaking of this garden, His Royal Highness said: “We may hope that it will, at no distant day, form the inner court of a vast quadrangle of public buildings, rendered easily accessible by the broad roads which will surround them—buildings where science and art may find *space for development*, with that air and light which are elsewhere well-nigh banished from this *overgrown metropolis*.” It is impossible to read these observations, and consider the promise of vast provision to be made for the development of science, and then compare them with what has since been accomplished as in fulfilment of them, without much wonderment, not unmixed with misgiving either lest the Prince himself may not have been labouring under erroneous impressions at the time of utterance, or that his intentions have, after all, not been loyally carried out by those whom he associated with himself in this great work. What we naturally ask is, as to the extent of this “vast quadrangle of public buildings,” of which the Horticultural Gardens were to form but “the inner court,” and in which science and art were to find “space for development” under circumstances so

exceptionally favourable? Well, then, the two International Exhibition Galleries measure each 1,100ft. long by 30ft. wide, the two equal to about an acre and a half; and allowing, at a rough guess, three acres for the space on the north (partly occupied by the Royal Albert Hall) and the site of the sheds on the south, there would appear to be, more or less, four and a half acres in all, out of eighty-six acres originally purchased, now applicable to the purposes of the grand “common centre of union” of the arts and sciences.

In the statement of the Provisional Committee of the Royal Albert Hall, issued in 1865, we are told of numerous representations which had been made shortly after the closing of the Great Exhibition of 1851, “on the part of chambers of commerce, learned societies, and other bodies of persons interested in science or the arts,” in favour of the establishment of this much-vaunted “common centre of union.” Where, may we ask, are any of these “chambers of commerce, learned societies, and other bodies of persons” to be found availing themselves, or likely to ask to be allowed to avail themselves of it, now that it is completed, or on the era of completion? And if any such should propose to avail themselves of it, what possible means is there of affording them the accommodation they may require? The same “statement” of 1865, in another paragraph, is a little more definite upon this subject. Speaking of “the Society of Arts, the Sacred Harmonic Society, the Royal Horticultural Society, and other societies, as well as many eminent persons,” as having “declared their intention of connecting themselves with the Hall,” yet, with the exception of the three societies first named, we see no sign of any public bodies or eminent persons coming forward in the way suggested; and of these the first two have only as yet connected themselves with the Hall in the way of getting up concerts and oratorios. The Society of Arts, though from the first the great patron and the great ally of the “central” scheme, have not, any more than any other of the learned societies of the metropolis, evinced the least indication of a desire to establish its home within the precincts of “Albertia.”

As the ground for the Horticultural Gardens was given for a term of years, rent free, or at a nominal rent, in consideration of a certain outlay being made by the Society, so the site for the Royal Albert Hall was given under a lease for 999 years, at a nominal rent of 1s. per annum, on conditions that money or means should be found to build the Hall, at a cost of £200,000. It was sought to obtain this sum by selling boxes and stalls in the proposed music-hall, in perpetuity, at the rate of £100 a seat; boxes to accommodate ten persons at £1,000, five persons £500, and so on. The total number of reserved seats so disposable is 2,500, equal to £250,000, of which, as we gather, some £120,000 worth only were disposed of by the year 1867, when the contractors came to the rescue, and undertook to complete the building, upon receiving security on the remaining unsold seats, for the balance over and above the sum subscribed. And thus it was that her Majesty was enabled to lay the foundation-stone of the building last spring, and to open the building itself on the 29th March last.

We may here declare our doubts whether, in the spirit in which the '51 Commissioners were appointed, and in which they were sanctioned in the disposal of their surplus funds in land purchases, these appropriations of the ultimate bulk of their landed estate to two corporate or chartered trading bodies, free of cost or charge in the shape of rent or otherwise, was justifiable. Certain it is that in the one case it reduced an old-established, and to a certain extent distinguished society, from its former condition of exclusiveness by right of membership to

a trading body, content to take sixpence a head for admission to their grounds; and that in the other case they, without any appearance of necessity, established a monster concert-hall to enter into competition, under the favouring auspices of royalty and of the world of fashion and wealth, with concert-rooms and music-halls, which the metropolis already contained in more than sufficient abundance.

But the '51 Commissioners did not, so far as we can gather, bind the Committee of the Royal Albert Hall in any covenants as to providing entertainments of music, or any other kind, nor even to provide for the necessary repairs and maintenance of the building. Neither did the illustrious, noble, and wealthy personages who so readily paid down their money for seats in perpetuity, take the trouble to ascertain that anything of this kind would be provided for their delectation. The question, then, naturally arises—what is to come of this new monster music-hall? Who is to undertake the risk of management, providing a sufficient number of entertainments; and what would be his chances of success?

Let us make a rough estimate on the subject. The Provisional Committee of the Royal Albert Hall, in their prospectus issued at the commencement of the present year, stated, in emphasised Egyptian type, that "the cost to a non-subscriber of attending all the various ceremonies and performances in the Hall, and of obtaining any privilege attached to a seat during the spring and autumn of this year, would be upwards of £25." This no doubt was intended as an incentive to the gentle public to subscribe for seats, and certainly 25 per cent. of enjoyment, transferable and saleable, in a single season, upon a purchase in perpetuity, pointed to a not undesirable investment. Looking, however, at what has already been done in the hey-day of spring and summer, and what may be expected at the fall of the year, we confess that we do not see much probability of the realisation of the prospect so temptingly held out.

Still, however, £25 as the subscription for the season for a place of first-class entertainment, would not be out of the way. A stall at the opera costs forty guineas, or thereabouts, for the season of forty nights. How, then, would stand the account of any person who should be enterprising enough to undertake the management of the Royal Albert Hall, under the peculiarly tempting conditions of having no rent to pay? To put the figures very loosely, and in lump form, say, maintenance of building, staff, &c., at the very least, £5,000 a year; and twenty (only twenty) concerts, or other entertainments, on a commensurate scale of magnitude, including gas, advertising, &c., at £600 each, £12,000,—total, £17,000; being the very lowest sum that a musical season on a very moderate scale could be carried on. To take the opposite side, there remain, after £200,000 worth are sold in perpetuity, about five hundred reserved seats to dispose of, besides a thousand open seats in the arena or pit, and about two thousand seats in the gallery, orchestra, organ gallery, &c. Is it likely, we ask, supposing such a venture to be made, that, all the *élite* of fashion being already provided with transferable seats to the number of 2,000, the manager could hope to utilise the remaining accommodation at his disposal to the extent of producing £850 on every one of the twenty nights of his season, which sum would merely cover his outlay? If not, he must be a loser of capital, to say nothing of time and labour. On the other hand, there are, to be sure, certain small perquisites to be made, beyond the larger business alone indicated. For example, last Friday a fashionable Bazaar or Fancy Fair was held in the arena of the Hall—for a "charity," of course—to which half-a-crown admission was charged, and concurrently with that interesting ceremony the band of

the Garde Républicaine of France performed in the orchestra, when sixpence a head was charged to hear them. But is it not ignominious to descend to such trifles, in such a great "central" cause?

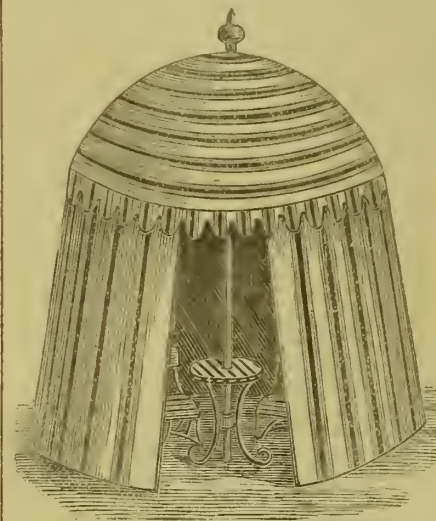
It remains but to say one word upon the acoustic properties of the building, about which much hesitating criticism has been bestowed by the gentlemen critics of the papers. Personal experience, on repeated occasions, compels us to report most unfavourably as to the present condition of affairs, which we consider cannot be remedied without an extensive and radical change in the structural arrangement. At first starting there was a distinct echo, which it has been sought to subdue by putting up a tent-like drapery, called a velarium, at the roof of the hall. The consequence is that the volume of sound, already none too large for the immense area to be filled by it, is dulled, and to a certain extent destroyed, whilst the reverberation continues to be apparent more or less according to the volume of sound, in the form of a dizzy burr, constantly pervading the air, with wearisome effect on the ear.

To conclude, the Society of Arts, which at present manages the concert business, seems to be quite awake to the maxim of "making hay whilst the sun shines," and for the programme of a very mediocre concert has the modesty to charge a shilling.

OMICRON.

AN UMBRELLA SMOKING TENT.

THIS, says the *Farmer*, is, in fact, an umbrella tent bower, where the inmate is quite secure from the inclement weather, and where he can enjoy a cigar with the greatest *nonchalance*, secure from



general observation. A bower of this kind is more suited for the cricket-field, the race-course, the common, and the park, on gala days, than for generally useful purposes about a garden. We prefer, as a rule, such bowers as are capable of being decorated with flowers before we admit them as associates for the furnishing of our pleasure grounds. Still, this is useful for purposes which other bowers cannot serve. It can be put up and taken down at pleasure, with very little trouble, and in these days of pleasure-hunting, that is a desideratum. It is suitable, too, for all weather, and being so, will be readily suited by such as seek shelter from the rain, on the one hand, and broiling weather on the other. With the furnishings it is most complete, offering all the convenience in the shape of seats and table that an ordinary room affords. It is, therefore, besides a smoking tent, a suitable lunching one. Many prefer a sandwich and a beverage of a character to suit individual appetites in the cool shade of an improvised tent in summer, and this will do quite as well as any other thing of the kind in the market. True, it is somewhat cumbersome to move about, but a lot of these placed in public parks on great "outing" days would be much taken advantage of. Some of them might be erected in parks and pleasure grounds for some such purposes as above named. They are made of steel and cane frame to adjust as an umbrella, and covered with ornamental waterproof canvas.

FIREPROOF ROOFING.

SOME interesting experiments were recently carried out at the Patent Stone Works of Mr. Frederick Ransome, at Greenwich, in order to ascertain the power of the roof covering lately introduced into this country by Messrs. Erichsen & Co., of Copenhagen, to resist the action of fire.

Two timber sheds had been previously constructed, both precisely similar in size and material employed. Each shed was 10ft. by 6ft. square, and 7ft. high. One of them was covered with slates resting on rafters, the other was covered with the so-called roofing pasteboard. Fuel consisting of straw and wood was placed in equal quantities in each hut, and ignited. In the slated roof the slates began to perish twelve minutes after the fuel was ignited, and in twenty-five minutes it was entirely destroyed. In the mean time the roof of the other shed remained, to all outward appearance, quite perfect, nor was it destroyed when the fire had burned out, and the whole of the shed had fallen down.

A part of the pasteboard covered roof was also covered with a coating of Ransome's silicious paint, and one of the most interesting results obtained was in reference to this material. Not only did it remain quite untouched by the action of the fire, but the boarding upon which it had been laid resisted the action of the flames to such a degree that for a quarter of an inch in thickness the wood was entirely destroyed.

Messrs. Erichsen's covering has already earned a good reputation in Denmark, and will doubtless be appreciated here, but the experiment of the other day pointed out so clearly the advantages attending the use of the silicious paint as a fire-resisting medium, that the greatest publicity ought to be given to its efficiency. We (*Engineering*) have already pointed out the good services this material renders in waterproofing walls; to a limited extent it has also been employed in covering the wood-work of buildings with the effect of making them almost fireproof. Indeed, so thoroughly reliable is it, that if a piece of timber coated with the substance is placed in a fire and allowed to remain exposed to intense heat it will be found upon removing it that the paint remains as a shell, and intact, the charred wood contracting from it on all sides. With so inexpensive and effective a fireproof medium available, there is every reason for its universal employment, which would be attended with so much increased security to life and property.

EDUCATION AND ARCHITECTURE.

MR. H. H. VALE, the President of the Liverpool Architectural Society, in his closing address of this year's session, said:—"One of the great wants of modern architecture I believe to be individuality—not the individuality of the party or clique, but of the artist. We are all too much running in grooves, but, unluckily, in other people's grooves. It would be a glorious result of the life of any one of us to have developed a style peculiarly adapted to only one particular class of building, be it house, mansion, chapel, church, asylum, jail, hospital, workhouse, which by common consent should be recognised as good and pleasant and suitable. An architect who had succeeded in doing this might rest upon his laurels, and defy the changes of fashion to bring disrepute upon his productions. The tone of education is being daily raised, not the mere knowledge of things, but the education in principles and the reason why of things. It is not to be able merely to quote Latin that laborious days are given by our youth to the works of Horace and Cicero, but that the one may impress the mind with the gentleness that springs from learned pursuits, and the other imbue it with the strength that is born of public virtue. The stern discipline of the Latin grammar is not meant to make all our boys Scaligers, or Schlegels, or Lindley Murrays; but what drill is to the soldier, grammar is to the scholar, imparting at once grace and vigour. Now it has struck me that we should study the old styles and orders of architecture in a somewhat similar spirit, not to measure and define everything we do into modules and fractions of inches, but to learn the general principles of good proportion, so as to apply them in modern practice. As I before said, the study of ecclesiology, or sacred archaeology, has a tendency, if not taken up in a liberal spirit and with a definite aim, to cramp and trammel the inventive faculties. Because we find the porch placed on the second south bay, the pulpit on the left hand of the chancel arch, the font near the western door, the altar raised so many steps, the tower adjoining the transept, and so forth, in certain old churches, are we therefore to forget site, forget aspect, and forget levels, in order to pander to this false tendency of archaeology, by following ever-

lastingly in the grooves of precedent! like the man who is said to have spent his life by letting down empty buckets into empty wells.

"I have dwelt somewhat at length upon some features of modern architecture from a feeling of disappointment on noticing views of recent churches designed by the few representative architects this country possesses, evidently under the pressure of Anglican sacerdotalism—designed by men who commenced their careers upon an unquestionable stock of originality and genius, but who, having achieved a well-earned popularity, are satisfied to decline upon the rewards of popularity—viz., good pay and aristocratic patronage. Now, when this occurs, our only chance is to stir up the coming men to strike out individual pathways for themselves; and it is mainly with that object our Society offers its prizes to the students in their competitions, which are always, I am happy to say, so well responded to. To the students, at the close of another session, I would say, in no deprecating spirit, that I always consider it a mistake for any of us at any time to believe that we have done our best. As life expands how very much improvement are we ever able to discern in our own productions. The judgment becomes matured, and the restlessness and indecision of youth gives place to a firmness of touch and earnest depth of feeling and reality, resulting from a continuous application to a pursuit which daily circumstance weaves into the web of our mortal existence. It is recorded of Thorwaldsen that when he had finished his wonderful statue of Christ he was overwhelmed with melancholy, and when asked the reason he touchingly replied, 'My genius is decaying.' 'What do you mean?' said the visitor. 'Why, here is my statue of Christ; it is the first of my works that I have ever felt satisfied with. Till now my idea has always been far beyond what I could execute, but it is no longer so. I shall never have a great idea again.' This, it may be remarked, has been the case with all men of genius, whether expressing themselves in form, or word, or colour. It is only God Himself, as it has been finely said, who could look down upon His creation and behold that it was very good.

I believe in the philosophy of one of the Latter-day pamphlets by Thomas Carlyle, which teaches us to distrust the motto "Nulla dies sine linea," for we have indeed to erase very many lines which are made upon very many days, and we feel all the better for the knowledge that we destroyed those lines from an impulse that there lurked in the hand and in the pencil stronger and firmer and better lines to replace them.

PATENT LAW REFORM.

At a meeting of London patent agents, on the 4th inst., Mr. George Haseltine, M.A., in the chair, it was resolved:—1st. That the chief defects of the patent laws have arisen from a want of appreciation of the natural rights of inventors to the sole use of their inventions, an unreserved recognition of which rights must pervade every equitable patent system, and the true aim of patent legislation is to harmonise these individual rights with the material interests of the State. 2nd. That the grant of patents to mere "first importers" is an injustice to inventors, an injury to society, as it induces the "pirating" of inventions, and the reason for these grants no longer existing, legislation should confine the issue of patents to actual inventors and their representatives. 3rd. That, in view of the benefits inventors confer on the public, and the expenses incident to the completion and introduction of new inventions, a patent for fourteen years is an inadequate compensation, and we deem it expedient to grant patents for a term of twenty-one years without the privilege of extension. 4th. That the patent laws impose penalties upon inventors in the form of excessive fees, which justice and public policy demand should be reduced to the amount requisite to defray the expenses of an efficient administration of a simple patent system, and fees of £10 for the entire time—now £175—would yield more than sufficient for the purpose. 5th. That the defects of the present practice should be remedied by the adoption of equitable "regulations," and the introduction of the system of granting patents, at the risk of the applicants, without any official supervision of the specification or preliminary investigation of the merits of the invention. 6th. That the rights of patentees should be determined by a competent tribunal, excluding all technical objections to the validity of the patent, and we deem it expedient to dispense with jurors and "scientific experts" in patent suits. 7. That these resolutions, signed by the chairman, be forwarded to the Parliamentary "Select Committee on Letters Patent," and such other publicity be given them as he may deem conducive to the success of a liberal measure of patent legislation.

PARLIAMENTARY NOTES.

THE BRICKFIELDS.—The Earl of Shaftesbury, on Tuesday, moved an address praying for Majesty to take into her consideration the state of the children in the brickfields as reported by the Commissioners in 1864, with a view to their being brought under the protection of the Factory Acts. The noble earl said that those children, who were mostly girls, were 30,000 in number, and their ages varied from three years and a half to seventeen years. They were kept at work from thirteen to sixteen hours a day, and the severe labour to which they were subjected was found to have a most pernicious effect both upon their physical and upon their moral condition. In fact, the state of these brickyards was a disgrace to the country, and it ought not to be tolerated one day longer. Nor could it be said that in all cases it was the poverty of the parents that induced them to expose their offspring to this physical and moral ruin; for persons with £2 or £3, or even £4 a week had been known to send their children to the brickfields in order that they might themselves indulge in the vilest extravagance and the foulest vice. It was the duty of Parliament to interfere, not only in the interest of the children, but in justice to those employers who had voluntarily put themselves under the restrictions of the Factory Acts. (Loud cheers.)—The Bishop of London also thought that there was no department of child labour that more urgently called for the interposition of the law than this brickmaking.—The Earl of Morley said that the statement of the noble earl was unfortunately quite accurate, and he was glad to say that a bill had been introduced into the other House for the purpose of remedying the evil; but he (the noble lord) proposed to introduce into his own Workshops Bill clauses for the purpose of attaining the same object. (Cheers.)—Viscount Middleton thought that the abominations connected with the agricultural gangs were far exceeded by those that might be seen in ordinary brickyards.—The motion was agreed to.

S. STEPHEN'S CRYPT.—In reply to Mr. W. Lowther, Mr. Ayrton said, on Monday, it was true that the lamps which had been put up to make the darkness of the "vault" more visible had emitted smoke which had caused the altar rails to be damaged. The easiest way of getting rid of that evil would be to remove the lamps altogether; but in that case the decorations would not be as much seen as they were at present.

THE SCIENCE AND ART DEPARTMENT.—Mr. Dillwyn gave notice that on the Civil Service Estimates he would move to reduce the vote for the Science and Art Department by the sum of £15,000.

ARCHÆOLOGICAL SOCIETIES.

THE WARWICKSHIRE ARCHÆOLOGICAL SOCIETY.—Last week the members of the Warwickshire Archæological Society had their annual excursion, choosing as the scene of their explorations the county of Kent. On Monday afternoon the party arrived at Leeds Castle, where they were welcomed by Mr. and Mrs. Wykeham-Martin. The party included the Rev. R. P. Brodie, vice-president and honorary secretary, M. Bloxam, Esq., F.G.S., and the principal members of the association, to the number of about twenty. On the following morning they were joined by Mr. Lightfoot, curator of the Maidstone Museum and secretary of the Kent Archæological Society. At 10 o'clock on Tuesday morning Mr. Wykeham-Martin showed the company over his fine old castle. Leeds Castle was originally erected by one Led, Ledian, or Ledian, chief councillor to Ethelbert II., King of Kent, about the year 857, or shortly before the end of the Heptarchy. It was ravaged by the Danes, but restored. The late Mr. C. Wykeham-Martin, in his history of the castle, considers it highly probable that Bishop Odo had a residence there, and almost certain that Leeds Castle was a Saxon fort of timber before the more important fortress was erected by the family of Crevecoeur. Bishop Odo having fallen into disgrace, the Crown resumed the castle, and granted it to the family of Crevecoeur. From the Crevecoeurs, Leeds Castle passed to the Leyburns, who shortly afterwards made it over to King Edward I., who gave it to Queen Eleanor, and it thereafter, until Edward VI. gave it to Sir Anthony S. Leger, remained for a long space of years the jointure of the Queens of England. In the time of the Crevecoeurs it had become an important stronghold—so important, in fact, commanding as it did the chief highways of Kent—that this may have been the principal inducement for the King to get possession of it. Under Edward it was immediately improved, and under successive monarchs it was added to and strengthened, until it attained to the first rank. Built on three separate islands, with a moat which may without impropriety be termed a lake, each separate portion being independent of the other, and capable of defence should the others be taken, it would appear, in the light of such military engineering as the Middle Ages possessed, that nothing but surprise or famine could reduce Leeds Castle. Through the lapse of time Leeds Castle became dilapidated, but by the laudable exertions of the late Mr. C. Wykeham-Martin it has been restored to about the con-

dition in which it would be seen in the Middle Ages. In the afternoon the party drove to Brishing (Boughton) quarries, where the Lower Greensand formation crops out in a very perfect form. From Brishing the excursionists drove to Linton-park, and next to Maidstone to visit the Charles Museum. On Wednesday the members divided into two parties, one going on a geological excursion to Gravesend, and the other to Canterbury. The last-named party were met on their arrival by the Dean, who accompanied them over the cathedral. Thursday was devoted to Rochester, Friday to Knole-park, and on Saturday the party broke up.

Building Intelligence.

CHURCHES AND CHAPELS.

BICESTER.—The foundation-stone of a new church dedicated to All Saints, was laid at Fewcott, near Bicester, on the 30th ult. The cost of the building will be £800; the plan consists of nave and apse. Mr. H. Woodyer is the architect, and Mr. Claridge, of Banbury, the builder.

BRISTOL.—On Tuesday afternoon the foundation-stone of S. Matthew's Church, Moorfields, was laid. The church will consist of a nave, side aisles, north and south chapels, chancel, and sacarium, with tower and spire 120ft. high; the south chapel forming ministers' vestry, and the north chapel the organ chamber. The style of architecture is early thirteenth century work, the tracery of windows, wherever introduced, being what is commonly called "plate," and all the detail generally being of a simple character. The walling will be of Pennant work, neatly piced, with freestone dressings, the inner walls being plastered to the face of stone jambs and quoins. A contract has been entered into for the erection of the nave, south aisles, chancel, sacarium, south chapel, and tower, up to the level of the clerestory windows, at a cost of £1,600, leaving the north aisle, north chancel, and completion of the tower and spire to some future day. The church, when completed, will seat 600, and the portion about to be built 450 persons. The contractors are Messrs. Wm. Banner and Co., of Cathay, Bristol; and the mason's work will be executed by the Messrs. Beaven, of Bedminster. The architect is Mr. J. Neale, of 24, Clare street, Bristol.

CHESTER.—The third annual report of the committee for the restoration of Chester Cathedral, in resuming the history of that restoration from the point where it was left last year, says:—The progress of reparation during last year was very rapid, completing the tower (which appears now, in the main, as seen in the year 1500), the topmost stone being laid on September 22, 1870, in the presence of members of the British Association and other visitors. The south aisle of the nave has been admirably groined in stone, and the walls and arcades of the nave and south aisle cleansed from whitewash, repaired, and repointed. The oak vaulting of the nave is far advanced, and may be expected to be completed in the coming autumn. The reparation of the nave (outside) roof has been completed in a most solid manner. The west end has been considerably advanced; the consistory court has been cleansed from whitewash; and the south porch, which is to be groined, is approaching completion. The windows of the clerestory are now complete. It has been resolved that in the west side flying buttresses should be added. In the eastern part of the building the gable for the Lady Chapel has been in part imitated from the Lady Chapel at Salisbury, and is now erected; and in the easternmost bays the windows will be filled in with stained glass, illustrative of the lives of SS. Peter and Paul. In the south-eastern portion, the singular roof of the apse has reached a considerable elevation, and the restoration of the turrets and pinnacles at the east end of the clerestory has been begun. The pinnacles on the buttresses to the south of the choir have been completed. The next desirable parts for reconstruction are the demolished south cloister and the groining of the north aisle of the nave, for which it is proposed to raise £3,500, of which £1,500 has been promised or paid.

LILLEY.—The new church at Lilley, Herts, was consecrated on S. Peter's Day, by Bishop Piers Claughton. The architect has been Mr. Thomas Jeckyll, of London, and the new edifice consists of a chancel and nave, the former 32ft. by 16ft., and the latter 53ft. by 25ft. Its style is Geometrical, and the seats are all free and unappropriated.

OKEHAMPTON.—The old church of the parish of Ashbury, near Okehampton, has been found to be in so dilapidated a state that it was determined to rebuild it entirely, and on Monday week the corner-

stone of the new chancel was laid. The plans for the new church have been prepared by Mr. J. F. Gould, architect, of Barnstaple, and Mr. Dendell, of the same place, is the contractor.

REDCAR.—The new chapel of the Convalescent Home, Coatham, Redcar, has been opened. The chapel has been erected by Mr. Wm. Langdale, of Whitby, from plans by Mr. G. E. Street, R. A. It consists of nave and apsidal chancel, and is capable of holding 200. The length of the nave is 61ft. 3in., and of chancel 18ft. 9in.; width of nave, 21ft.; height, 17ft. to top of wall plate, and 36ft. 9in. to apex of roof. Bell turret at west end, with bell by Messrs. Mears. The chapel is lighted by lofty windows, of which seven are already filled with stained glass—viz., two west windows with Christian emblems, three apsidal with scenes in the Passion of our blessed Lord, and other two in chancel with subject from parable of the Good Samaritan and the corporal acts of mercy; all by Wailes, of Newcastle. The reredos, a gift by an anonymous donor, is of alabaster inlaid with marble, by Earp.

ROCHESTER CATHEDRAL.—The Dean and Chapter of Rochester are about to undertake the restoration of their Cathedral, which in some parts is in a very bad state. The work has been intrusted to Mr. Gilbert Scott, and will shortly be commenced; the restoration will be effected in sections, the first part to be effected being the replacing of the clerestory windows in the nave. Service will then be held in the nave while the work of restoration proceeds in the choir and chancel. At the east end of the Cathedral the ancient windows will be restored—a great improvement; and by the lowering of the floor of the chancel the bases of the pillars will be shown. Some portions of the exterior of the building are at present in a lamentable condition—the ancient stonework being patched by brick. Mr. White, of Vauxhall-bridge-road, London, will be the builder who will carry out Mr. Scott's designs.

SALISBURY DIOCESAN CHURCH BUILDING ASSOCIATION.—The quarterly meeting of the committee of this association was held at the Board-room, in the Close, on Thursday week. There was only one application for consideration—namely, from the Rev. T. B. Buchanan, for aid towards a restoration of the parish church of Potterne, Wilts, an edifice consisting of a chancel, nave, north and south transepts, and tower. It appeared that the Commissioners are about to restore the chancel, and that the parishioners consider this a favourable opportunity to complete the work by effecting an entire reparation of the external and internal portions of the remainder of the building. The re-seating of the church is also to be carried out, and although the removal of some unsightly galleries will diminish the number of sittings, the re-arrangement of the seats will afford ample accommodation for the parishioners. The total cost of the works is estimated at £1,650, of which about £1,400 has been provided, and the committee voted a grant towards carrying them out.

STURTON.—On St. Peter's Day the parish church of Sturton, near Gainsborough, was reopened after restoration. The church was founded towards the end of the twelfth century, and the portions remaining of this date, the north arcade of the nave, the north and south doorways, and a doorway and small window on the north side of the chancel, are good examples of the Transition period, when the Norman style was changing to the Early English. The south arcade was rebuilt in the thirteenth century, and the western arch on this side further altered in the fifteenth century. The lower part of the tower and the church chancel windows, also the chancel stalls and screens, date from various periods of the fourteenth century; and the upper stage of the tower, with its twelve pinnacles, was added during the fifteenth century. In later times the church had been much modernised and spoilt by various additions and alterations. Inside the church was even in a worse state than the outside. The restoration has been a very complete one, and the great aim has been to keep all ancient features unaltered, and to restore them where destroyed or obliterated. The north and east walls have been entirely rebuilt, and the windows restored throughout, as nearly as could be traced, to their original forms. The ancient work has been repaired and cleaned from whitewash, &c., and a new porch built over the south doorway. The modern clerestories have been removed, and a new open roof of the original pitch placed upon the ancient walls. The roofs throughout are covered with lead. The tower has been restored and thrown open internally. The vestry is inclosed in the north aisle by a simple screen instead of the old wall.

WHITWASHING THE CHURCH AT ROSS.—During the last fortnight, according to the local journal, "this sacred edifice has been thoroughly cleansed. The interior of nave and chancel has been carefully

covered with two good coats of whitewash, and is now as neat and clean as the Wesleyan Chapel."

BUILDINGS.

LEITH.—There is now approaching completion in Bernard-street, Leith, a building to be occupied by the Union Bank. Mr. J. Simpson is the architect. In front is an elevation three stories in height, designed in the Italian style of architecture. The main entrance has a neat portico, flanked with Peterhead granite columns, and surmounted by a balustrade; and an oriel window, with pilasters and architrave dressings, is carried up the whole height of the building, the façade being finished a-top with a handsome cornice and balustrade. The contractors for the work are Messrs. Beattie & Son, Edinburgh.

SALFORD.—The Salford Board of Guardians have decided to erect, on land adjoining the workhouse, new school buildings, which are designed to accommodate 500 children. The estimated cost is from £10,000 to £12,000. Messrs. J. M. and Henry Taylor, of Manchester, are the architects whose plans have been accepted.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

RECEIVED.—R. W., J. B., S. G., P. D., G. R., T. W., J. J. C. & Co., C. H. L., W. B. & Son, C. & H., J. M. S.

THE "BUILDING NEWS Sketch Book" has been sent to all the contributors to it whose addresses we have. The other contributors who have not received it will please communicate with the office.

To the author of the design, "Mayor, Town, Law and Order," for the Leicester competition.—Every mother's duck is a swan. You think your "design was overlooked by the architect." The other designs must be very poor if yours had the preference. We cannot promise to give an illustration of it in the BUILDING NEWS.

Correspondence.

STEVINGTON CHURCH, BEDFORDSHIRE.

To the Editor of the BUILDING NEWS.

SIR,—I much regret that your correspondents "W. R." and "H. W. P." should have so mistaken the purport of my communication with regard to the restoration of the above church. I had no desire whatever to cast any reflection upon either the appointed architect, or Nonconformist practitioners in general, whose works may, according to "H. W. P.," "compare favourably with many ecclesiastical men." Had the building in question been a modern one, I should certainly have considered any remarks of mine to be uncalled-for and impertinent; but as in this case an interesting old church is concerned, I feel that all who have any reverence for the past or possess any artistic feeling are justified in protesting against its value as a relic being lessened or deteriorated.

I must say, and I think it will be admitted by all who are conversant with the subject, that to restore an old church faithfully and well there is required something more than an acquaintance with Gothic architecture as practised by Nonconformist architects of the present day; and it cannot be reasonably expected that those who erect their places of worship in defiance of all ecclesiastical tradition, and who conscientiously ignore ritual observances, should bring to bear much knowledge of the kind required in the important work of restoration, which, strictly speaking, means the bringing back an old building to what we know or reasonably suppose from analogy to have been its original state. The Nonconformist architect may also consider much of what is generally brought to light in the progress of work of this description to be simply connected with superstitious usages, and can hardly be expected to care much for their preservation, and thus what is of inestimable value to the archaeologist or antiquarian is lost irretrievably.

The reasons I have given for making the communication through your journal (which it appears has unfortunately offended your correspondents) are simply what I have stated, and no other motive was contemplated by me in doing so. I cannot, in conclusion, help saying that those who are the legal guardians of our churches have much to answer for,

and are responsible for any damage they may sustain through allowing unskilful or irreverent hands to touch buildings consecrated and hallowed by the prayers of ages, and not in many cases the architect, who no doubt performs his work in accordance with what he deems to be right, but who may never have given to ecclesiastical matters that attention which he has devoted to other branches of his profession.—I am, &c., ECCLESIOLOGIST.

LITTLE GADDESSEN CHURCH.

SIR,—I may be wrong, but certainly the central composition of Mr. Godwin's design in your last number suggests to my mind a reference to the worship of the phallus. Now, that ought to be guarded against. It is not retrogression we want, but progression. Surely the time will soon arrive when any such allusion to, or perpetration of, the old degrading and people-destroying rites and customs of the ancients should be discontinued. There is sufficient room for a new style of art which shall excel all that has gone before it, but said style must be adapted to newer and more elevated ideas. We think it has already begun, only that eternal looking behind is a terrible drag upon it.—I am, &c.,

July 10, 1871.

P.

THE LONDON UNIVERSITY AND THE LAW COURTS.

SIR,—A warm admirer of the design of the London University in Burlington-gardens, displaying as it does much originality of treatment, governed by refined taste, I have hoped to see a fitting view of it in the BUILDING NEWS. I have seen a wood-cut illustration of it in another journal, but such was, I considered, a mere caricature of it. The clearly-drawn, accurate style of the engravings in the BUILDING NEWS would permit the beauties of this design being seen. I should like those foreigners to know that whilst the mania of a cliquerie here for Mediaeval monstrosities, machicolated burlesques of an uncompromising style, there is still amongst us some one who can design with taste, skill, and common sense in the style which the wisdom of the whole civilised world recognises as that best adapted for modern requirements. I hope, sir, that by the favour of Sir James Pennethorne and yourself we may have good views of this building ere long.

As considerable interest and anxiety is felt respecting the new design for the Strand façade of the Law Courts, would it not be well if Mr. Ayrton were to submit it to public opinion? Though when carried into effect, if faulty, it will doubtless receive sufficient abuse, yet remedy then will be unattainable. It may perhaps be a good *Street* elevation, but not a good elevation for a street. The architect, it appears to me, is, unfortunately, not sensible of the value of symmetry. He appears to intentionally ignore it in favour of irregularity, or what may be termed "higgledy piggledy." As the noblest works of Nature are symmetrical, so this quality is absolutely necessary in high and noble works of man, as imperatively required, in the Gothic styles as in the Classical—in fact, in all styles. This law was seen and recognised by the old Gothic builders. When in isolated buildings on irregular sites, and when the exigencies of construction were at variance with rule, they accepted the difficulty, and built irregularly; but in towns rules of beauty and convenience of traffic induced symmetrical elevations and regular plans, as we see in numerous Hotels de Ville, &c., remaining to the present day. Symmetry in the disposition and balance of masses, large features, and a certain amount of repetition and uniformity are absolutely necessary to produce grandeur and the highest kind of beauty in architecture. Mr. Street's old design did not possess these qualities. Does the present one?—I am, &c.,

ARCHITECTUS.

BRICKWORK AND MORTAR.

SIR,—In Mr. Aitchison's very useful paper, reported by you in last week's impression, we are told that "mortar should not be too stiff, but sufficiently liquid to run between the joints, the object being to have a perfectly solid wall, every space between the bricks being filled up solid with mortar—a wet brick, a thin joint, and all the cross-joints filled in, being the perfection of brickwork; but the labour is so great to attain this, that a perfect bit of brickwork is rarely to be found, the nearest approximation being when the work is well grouted with thin mortar every foot in height."

So far Mr. Aitchison. In Col. Scott's "Lectures on Limes and Cements," also reported by you recently, I read that it is an absolute necessity, if good work is desired, to use "wet bricks and stiff mortar," and that Col. Scott "strongly condemned

the practice of grouting." I rather think that Mr. Seldon, in some correspondence on the subject a little while since in your paper, gave a similar opinion.

How is it that two practical men, each speaking on a subject which they seem to think themselves thoroughly acquainted with, give us precisely opposite advice on so every-day and comparatively simple a subject? We were not given, I think (in the report, at least) Col. Scott's reasons against the use of grout and in favour of stiff mortar; perhaps if we had these the case would be clearer.

In my part of the world (Liverpool) stiff mortar is rarely used, and I have had little opportunity of comparing its results, practically, with the ordinary thin mortar and grouting. But, as a matter of architectural appearance, I cannot concur with Mr. Aitchison as to thin joints constituting the perfection of brickwork. It appears to me that good stiff mortar used in thick joints, and recessed slightly from the face of the brickwork, instead of being plastered on in relief by the absurd practice termed "pointing," should be as durable, or more durable, than a thin-jointed wall in sloppy mortar; and that in point of effect there is no comparison, the thick recessed joint giving texture, and light and shade to a wall, instead of leaving it a barren expanse of flat brick, while the comparatively rough surface thus formed makes an excellent relief to smoother materials, such as granite or stone shafts, or oak framing and corbelling. Oak, in point of appearance and tone, goes admirably with such brickwork.

I hope some practical man will give the "picturesque" architects the satisfaction of proving to them that, in this case, what looks best is also the best practically, as it generally is in other parts of architectural construction.—I am, &c.,

H. H. STATHAM, JUN.

THE METROPOLITAN BUILDINGS AND MANAGEMENT BILL.

SIR,—The interests of the building trades of the Metropolis are likely very materially to be affected by several clauses in this Bill, to be read the second time on the 26th inst. The stowage and converting of timber is materially interfered with by clause 120—all timber placed in yards where sawing is done must be separated from such machinery, or building containing such machinery, by a wall without openings its entire height, and no timber is to be piled or repled on the same premises with steam or other machinery, so that all the mills will be deprived of the advantage of a yard of any extent, as they must effectually divide it from their mill by what is termed a proper fence wall its whole height; the effect of this would be all the mills must draw their daily supply, and deliver the same along the streets of London. At present very much of the timber is conveyed up the river or along the City Canal, and piled in the yards thousands at a time. The further obstruction to the streets by the passing of waggon-loads of a hundred of deals, each say 16ft. to 18ft. long, and their four horses, will be no light augmentation of their terrors, and the practice now in use of storing the timber for small consumers at these yards until it is required for use will be entirely prevented, as the high walls would prevent any drying going on, which is the object of such piling. Many of our mills and yards will, if the Act is passed, be rendered at least but of half their present value, and great encouragement will be given for the further extension of the foreign trade in manufactured joinery, not on account of its price, but on account of the great difficulty of using machinery in its construction here; many thousands of artisans are likely to be deprived of their usual means of occupation. Statistics have been collected (and are at any person's inspection who wishes to consult them) from very many of the large houses interested, both in the building trade, joinery, carriage-building, cabinet-making, piano-forte-making, and in fact all trades using wood of any kind. An undue advantage is given to manufacturers beyond the present area of the powers of the Metropolitan Board of Works, an area liable to extension as the Board may think useful.

There are many excellent clauses in the Act, but those of a restrictive nature on this industry are very objectionable. They are inserted, as it is said, with the view of preventing fires. It is a fact that vastly more fires occur in yards where there is no machinery than where machinery exists. Surely, proper precautions taken to isolate the furnaces, and to prevent danger from fire, should be sufficient to satisfy the fire insurance companies and public interests generally. Should anyone take the trouble to consult the Act, they will find the facts are not fully nor over stated. Copies may be obtained for

a shilling from the publisher of Parliamentary Papers, in Old Palace-yard, Westminster.

All manufactories of timber where power is employed, will also be closed, as they will not be allowed to have on their premises the very material that is their daily need. They are not to place, pile, or re-pile any timber whatever in or upon the same building or near to it without this "fence wall;" it is prohibited on the same premises. Supposing the proprietors are able to remove their factories, what are the thousands of artisans with their families to do? As an instance of the effect of the removal of such factories, I would quote one at the east-end of London, Cubitt's Town, near the Eastern Counties Railway at Stratford—here quite a town has arisen to be scattered by this Bill. Precautions are necessary, but surely some more reasonable measure might be adopted by consulting those most interested?

OBSERVER.

THE "BUILDING NEWS SKETCH BOOK."

SIR,—I beg to thank you most sincerely for the "Building News Sketch-Book" just to hand. I am very much pleased with it, as it is most decidedly a beautiful volume, and the thanks of the contributors are due to the publisher for the style in which it has been got up.

I herewith enclose stamps to pay the expenses of the postage.—I am, &c.,

A. J. LACEY.

Princes-street, Norwich, July 11, 1871.

"CAVE AB HOMINE UNIUS LIBRI."

SIR,—This ancient apothegm has certainly a rather dubious, double-edged look. The warrant for my rendering is, however, sufficiently good. It is quoted in the same sense by the elder Disraeli in his "Curiosities of Literature"—a book, by the way, which is a library in itself—in a chapter he devotes in commendation to "The Man of One Book."—I am, &c.,

P. E. M.

Intercommunication.

QUESTIONS.

[2259].—**Measuring Brickwork.**—Will Thomas Pinch, who kindly answered a query on this matter, be good enough to inform me whether, in furnace chimney shafts, only the net brickwork is calculated, deducting the flue, and whether the London practice (whatever that is) is used throughout the country? I have heard that some surveyors measure the chimney as a solid piece of brickwork, the same as an ordinary house chimney.—X. Y. B.

[2260].—**A Grave Question.**—In old-established churchyards and burial-grounds it is customary to inter bodies with the feet towards the east. Could you inform me whether this is imperatively carried out in new cemeteries and burial-grounds, or whether, in cases where there are serpentine walks, the graves are allowed to front or foot towards the walks? As there is no cemetery within twenty or thirty miles of this place where I could obtain the information, you will excuse my asking the question through your medium, and your answer will greatly oblige.—A COUNTRYMAN.

[2261].—**Fireproof Flooring.**—Can particulars be furnished of that known as "the French method?"—F.

[2262].—**Cubing Brickwork.**—Has the question of measuring brickwork cubically ever received legal solution to the knowledge of any correspondents? Bricks of "larger growth" tell in the contractor's favour so far as length and height is concerned. Why not in width as well? If a two-brick wall makes 1ft. 7in., why not book it as such in lieu of "two-brick"? If no advantage of measurement is to be gained, why are bricks manufactured above the time-honoured regulation dimensions?—BLUE BRICK.

[2263].—**Ownership of Material.**—In the face of the following clause in a building agreement or contract, can trustees in bankruptcy obtain possession of unfixed material deposited on and about a building? "All materials, tools, tackling, &c., brought upon the works by the contractor shall become the absolute property of the building owner, the contractor merely having a right to use the same for the purposes of the contract, and any surplus shall be given up to the contractor only as part of the consideration of the performance of the contract."—F.

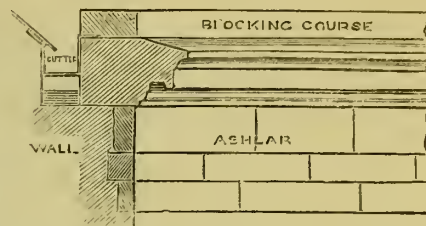
[2264].—**Modelling.**—Could any of your numerous readers inform me where the usual clay used for modelling can be procured?—F. L. E. P.

[2265].—**Hagioscope.**—Will some one oblige by describing an hagioscope?—M. B. L.

REPLIES.

[2245].—**Ashlar.**—With respect to the definition of the term ashlar, I would say that, in the trade, the above term always refers to any course or courses of stone that are either boasted, rubbed, or tooled on the face, and have their beds and joints squared with the chisel, in contradistinction to the term walling, of

whatever kind it may be, and there are many kinds. The latter is usually scappled with the hammer, or is drafted round with the chisel and broached, or it may be pitched faced, so that, more or less, the hammer is



generally used in dressing wall stones, but not always; but they are never boasted, rubbed, or tooled on face, which would at once bring them under the term of ashlar. Another distinction is, that ashlar courses are nearly always higher than wall-stone ones. As for "blocking-course," not "block-in-course," it is the plain course of stone that often forms the finish on top of cornice to a chimney-stack or to a parapet (as per sketch). It is a name distinct from ashlar, and may be easily known from the position it is always placed in. A FOREMAN MASON.

[2257].—**Fir and Pine.**—There is no general distinction between fir and pine. Both belong to the same order of tree, the *Conifera*, or cone-bearing tree; they are both resinous woods, and both are used for building purposes, although their properties differ. There are several kinds of the *Conifera* used for building and engineering purposes. The *Pinus Sylvestris* produces the timber that comes from Memel, Riga, Dantzic, and other Baltic ports, also the yellow deal of Europe and the red pine. The *Pinus Strobus* produces the Weymouth or yellow pine, called (in America) the white pine. The *Pinus Abies*, or Norway spruce, produces the white fir or deal of Europe; it is less resinous than Memel, Riga, or other Baltic timber. Then there is the *Pinus Resinosa*, or pitch-pine, a close-grained, resinous, and heavy wood. But, when we come to practical considerations, there is this difference, that fir timber, deals, and battens mostly come from the North of Europe—from Memel, Dantzic, Riga, Petersburg, Archangel, Christiania, Wyburg, &c.—and red and yellow (or white) pine from America, chiefly from Quebec. There are two important properties of timber distinct from each other, strength and stiffness. Baltic fir is stronger than Canadian pine, and pine is stiffer than fir. The former will bear a greater weight before it breaks, but it will deflect more under the same load. The practical difference between the two is, that Baltic fir is better for large scantlings intended to carry great weights, while pine is better for cutting up into small scantlings, and for all purposes where a soft and easily-worked wood is desirable.—C. S.

WATER SUPPLY AND SANITARY MATTERS.

SANITARY REFORM AT ROSARIO.—In consequence of the lamentable outbreak of yellow fever at Buenos Ayres, the inhabitants of Rosario have been discussing the best means of carrying out effective sanitary measures at that town. It is estimated that an outlay of 1,500,000 patacoons would place Rosario in possession of a proper water supply and a good system of drainage.

ILKLEY.—One of the Privy Council Inspectors has recently been inquiring into the sanitary state of Ilkley, and, on account of the bad condition of the sewers and drains, has recommended that the attention of the Home Secretary of State should be called to the default of duty of which the Ilkley Local Board of Health has been guilty as to sewerage and as to the inspection and abatement of nuisances from sewers and drains. If this warning does not suffice to awaken the Ilkley Board to a sense of its public duty, the *British Medical Journal* trusts that not only will the attention of the Home Secretary be drawn to the matter, but that Mr. Bruce will see that all necessary steps are taken, either by the Board or by some one whom he shall appoint under the power given to him by the Sanitary Act.

LAND AND BUILDING SOCIETIES.

IMPROVED INDUSTRIAL DWELLINGS COMPANY (LIMITED).—On Saturday week an extraordinary general meeting of the above Company was held at the offices, 34, Finsbury-circus, for the purpose of considering, and if approved, of confirming, the following special resolution, which was unanimously passed at an extraordinary general meeting held on June 8:—"That article 37 of the articles of association, which provides that the directors may convert any paid-up shares into stock, shall be, and the same is hereby, repealed, and in lieu thereof that it be provided as follows:—That the Company may by the vote of an extraordinary general meeting, modify the condition contained in the memorandum of association of the Company, by converting the paid-up shares of the Company into stock." Sir Sydney H. Waterlow presided. On the motion of Sir W. H. Bodkin, seconded by Mr. Morrison M.P.,

the resolution was unanimously approved and confirmed, and the proceedings terminated.

CITY OF ROCHESTER BUILDING AND LAND SOCIETY.—The annual meeting of the City of Rochester Land, Building, and Investment Society was held at the Guildhall on Monday week. The directors congratulate the members on the continued flourishing condition of the society at the completion of its seventh year of existence. During the past twelve months the business transacted has exceeded that of the preceding year, both in the advance and investing departments, and yielded a larger amount of profit than in any previous year. Since the establishment of the society the sum of £22,875 had been advanced to members, on ample securities, to enable them to purchase freehold or leasehold property; while £7,415, including profits, had been paid to members on withdrawal. During the same period the profits accruing to the society after the repayment therefrom of the entire expenses of management, and allowing for a reserve, amounted to £3,213, the whole of which had been divided among the investing members. The profits realised during the past year enabled the directors to appropriate an amount equivalent to seven per cent.

Our Office Table.

THE OLDEST ENGLISH CANAL.—The first canal made in England connected the rivers Trent and Witham. It was begun in the reign of Henry I. England has now 2,800 miles of canal communication, Ireland 300, and Scotland 175; making a total of 3,275 miles for the United Kingdom. The longest of these canals is that which joins Leeds and Liverpool, 127 miles in length, finished in 1816. The New River, which has supplied London with water, is a canal. The canal connecting Manchester with Worsley, built by the Duke of Bridgewater, in 1765, was cut, for eighteen miles, under ground, at a cost of £170,000.

LABOURERS, DWELLINGS.—Speaking of Lord Derby's speech at Liverpool, the *Salopian* says:—"If the landlords of Shropshire had as much good nature in their hearts as his lordship, they would not be such neglectors of such a good work as they are. We hope that his influence, and that of others like him, will induce them to engage in it. If they were to spend more of their money in building houses fit for their poor tenants to live in, this way of spending it would be quite as consistent with their respectability as spending it in superfluous equipages, in Epicurean feasts, in fox-hunting, horse racing, sporting, tours abroad, and in other more questionable ways. I would not positively assert, but from what I have observed on some of the large estates in the county, I should think that for one pound that has been spent this last hundred years or more for the improvement of the dwellings of the tenantry, the landlords have spent scores of hundreds of pounds in other ways, which perhaps, if known, would not reflect much credit upon them. The proprietors have the cash, and it is evident that if work-families are to have more creditable dwellings, the landlords must build them."

THE PRIORY OF S. BARTHOLOMEW, SMITHFIELD.—The vaulted substructure or crypt of the dormitory, just destroyed to make way for the erection of the offices of the City of London Union, was built in the latter part of the twelfth century. The architecture was of a Transitional Norman character; like most of these structures, it was divided into several compartments, and used for stores. The property is thus described in a deed of sale from King Henry VIII., to Sir Richard Rich, Lord Chancellor, and dated May 19, 1544:—"The chief mansion or prior's house, with the appurtenances, consisting of the infirmary, the dormitory, the frater-house or chapter-house, the cloisters, the galleries over them, the hall or refectory, the kitchen, the woodhouse, the garner or barn, and the prior's stables, all situated within the Close. The church within the great Close to be a parish church for ever, and the void ground, 87ft. in length, and 60ft. in breadth, next adjoining to the west side of the church, to be taken for a churchyard." The sum to be paid was fixed at £1,064 11s. 3d.

NORTON & MARRIAN'S NEW PATTERN-BOOK.—We have received from Messrs. Norton & Marrian, brassfounders, of Liouel-street, Birmingham, a copy of their new pattern-book, to be had from them on application. Many of the designs are novel, and some very good. Good taste, too, is not altogether sacrificed to cheapness. Of course, the popular taste in cornices, with lovely hanging appendages of fruit and flowers, and other kindred offences against art, must be provided for by all who hope

to sell their manufactures; but Messrs. Norton & Marrian have evidently laid themselves out for the support of a higher class of customers, and we recommend such to obtain their pattern-book.

STEAM FIRE-ENGINES.—The Corporation of Manchester, after carefully seeing into the merits of the steam fire-engines manufactured by the English and American firms, some little time since decided upon purchasing one from Messrs. Merryweather & Sons, chiefly on account of simplicity, easy management, and durability of their class of machine. This engine is of the double cylinder kind, and is capable of discharging 500 gallons per minute to a distance of 200ft. The boiler raises steam in nine minutes. The engine at the trials fully bore out the advantages that the makers claim for their speciality. During the late troubles in Paris an engine of this class was taken thither from Antwerp, under the superintendence of M. Cornet, the chief of the fire brigade, and was instrumental in stopping the spread of the conflagration, as also were five other engines supplied by the Messrs. Merryweather to the city of Paris previous to the investment.

THE INDIAN CIVIL ENGINEERING COLLEGE.—The alterations at the Indian Civil Engineering College are making rapid progress. The house when bought from Mr. Albert Grant contained 110 rooms. These have been sub-divided, so as to make 104 more. Another building, with above 100 rooms, has been put up, and the poles are in the ground for the first of the five villas for the professors' houses. Some of the professors have already engaged houses in the neighbourhood. Above 100 acres of land, and very fine grounds, gardens, stables, &c., belong to the place. The college is charmingly situated on the edge of the Bagshot sands, overlooking Runnymede, the Thames and its valley, to Harrow and the northern chalk on the left.

THE PROPOSED NEW FRUIT AND FLOWER MARKET.—A meeting of market-gardeners, nurserymen, and farmers was held at the Bedford Head Hotel, Covent-garden, on Tuesday week, for the purpose of receiving a sub-committee from the Markets Improvement Committee of the Corporation of London, and inspecting plans and improvements at Farringdon Market. The chair was occupied by Mr. Henry Meyers, President of the Market Gardeners' Association. Mr. Bontems was also present. Mr. T. Radkin, C.C., produced drawings of the new market proposed to be constructed in place of the present inconvenient and little-used Farringdon-market, and the meeting was engaged for nearly an hour in discussing and advising upon the necessary alterations. A motion was eventually passed to the effect that the meeting approved of the scheme so far as it had been put before them, and pledged itself to assist by all means in its power the efforts of the Committee in establishing the new market.

THE ARUNDEL CATHEDRAL AND THE BRIGHTON AQUARIUM.—A correspondent of the *Athenæum* says:—"On Friday afternoon I stood among the stately pillars of the [Roman Catholic] Cathedral, which is rising upon the hill beside the castle of Arundel; on Saturday forenoon I was conducted along the corridors of the Aquarium at Brighton. Sussex will soon be embellished with two buildings destined to be heard of all the world over. Guessers say that their cost will be much alike—about £100,000 each. They will both draw crowds. The Cathedral, although erected in a disfranchised borough, with a population of 2,498 souls, will make capital of historical associations and romantic scenery, of a leafy hill and a green plain, a gray ruin, a swan lake, a sedgy river. The Aquarium is built in London-on-Sea. The Cathedral spire will pierce the skies, the Aquarium burrows into the shingle; the one will be seen from afar, the other not until looked down upon quite near. The length of the nave of the Papal Temple will be 122ft.; of the halls and corridors of the Marine Temple, 700ft. The Arundel Cathedral will be more like the Madeleine at Paris than the Cathedral at S. Denis—with more of elegance and grace than grandeur and gloom. The Aquarium will rival the ocean caves, with startling effects of refracted light, plants, and animals, beautifully and fantastically formed and coloured. Everybody knows what will be done in the Cathedral for sinful souls; but nobody can foresee what the Aquarium may do in teaching men how to produce food in the sea. The Aquarium will certainly, we are assured, be ready in time to receive the British Association in 1872, and by that time, if any savants should need shriving, they may there find it in the magnificent fane now rising up beside the Castle of the Howards on the Sussex-hill which commands the winding Arun.

Chips.

The Chesterfield and Derbyshire Institute of Mining, Civil, and Mechanical Engineers was opened on Thursday week by Lord Edward Cavendish, the president. The object of the Institute is to advance the sciences of mining and engineering and the useful arts generally.

The *South London Press* gives currency to a rumour that the Surrey Theatre, Blackfriars-road, is about to be purchased by the trustees of Surrey Chapel (Rev. Newman Hall's), and converted into a place of worship. We are informed that there is no authority whatever for the statement.

A retired sculptor, named Benfield, committed suicide at the King's Head Inn, Newnham, Forest of Dean, the other day, by cutting the arteries of his left arm.

A scheme has been set on foot to extend the tramway from Brixton to Croydon, and the Vestry of Lambeth have been asked to give their consent.

A series of extracts from the records of S. Michael, Cornhill, commencing in 1456, and illustrating the history of that church and parish, are being privately printed by Mr. A. J. Waterlow. It is stated that Mr. W. H. Overall, the Librarian to the Corporation of London, is editing the work.

Mr. Parker's large collection of sections, drawings, and photographs of excavations in Rome during the season 1870-71 (about 2,000 in number) have been on view during the past week at the rooms of the Royal Archaeological Institute.

Besides the silver service of table decorations mentioned before as destroyed in the ruins of the Hôtel de Ville of Paris, there was a second, no less magnificent and beautiful, lost by Frontant Meurice.

Earl Beauchamp, on Tuesday afternoon, laid the foundation-stone of a new church at Kilburn, to be dedicated to S. Augustine.

Timber Trade Review.

PRICES, July 10.—Per Petersburg standard:—Quebec yellow pine, first quality floated, £16 10s. to £18; ditto second floated, £12 10s. to £13; ditto third floated, £8 10s. to £9 10s.; ditto first quality bright, £18 to £19 10s.; ditto second bright, £13 5s. to £14; ditto third bright, £8 15s. to £9 10s.; New Brunswick mixed pine, £7 to £8; Quebec spruce, first quality, £9 10s. to £11; ditto second, £8 10s. to £9; ditto third, £7 15s. to £8 5s.; S. John's first spruce, £8 10s. to £9; ditto second, £8 to £8 5s.; ditto third, £7 10s. to £7 15s.; ditto unsorted, £8 to £8 5s.; Nova Scotia and Prince Edward's Island, £7 5s. to £7 15s.; spruce battens, £7 to £7 10s.; United States pitch pine planks, £12 10s. to £13; Archangel best yellow, £12 10s. to £14 10s.; ditto second yellow, £9 10s. to £10; Petersburg yellow, £13 to £13 10s.; Wyburg yellow, £9 15s. to £10 10s.; Finland and hand-sawn Swedish, £7 5s. to £8; Petersburg and Riga white, £8 10s. to £9 5s.; Christiana best deals, yellow and white, £10 to £12 10s.; Gelfe and best Swedish deals, £10 to £12 10s.; Swedish battens, £8 10s. to £9 10s.

Lathwood per cubic foot:—Petersburg, £5 to £5 15s.; Riga, Dantzic, Memel, and Swedish, £3 to £5.

Firewood per cubic fathom:—Swedish deal ends, £4 5s. to £4 15s.; Norway red and white boards, £3 5s. to £4; round and slabs, £2 10s. to £3.

Timber per load:—Riga, £3 5s. to £3 7s.; Dantzic and Memel crown, £4 to £4 10s.; best middling, £3 5s. to £3 15s.; good middling and second, £3 to £3 5s.; common middling, £2 10s. to £2 14s.; undersized, £2 10s. to £2 15s.; small, short, and irregular, £2 to £2 10s.; Swedish, £2 10s. to £2 15s.; ditto small, £2 5s. to £2 8s.; Swedish and Norway balks, £1 12s. to £1 18s.; Memel crown oak, £5 10s. to £6 10s.; ditto brack, £4 10s. to £5 5s.; Dantzic and Stettin crown, £5 to £6; brack and unsquared, £3 15s. to £4 15s.

Trade News.

WAGES MOVEMENT.

DUBLIN.—The carpenters and stucco-plasterers of Dublin, who have been for ten days on strike, have agreed to leave the question of their claim for higher wages and other matters in dispute to arbitration, appointing on their part a merchant of the city to act as judge.

LINCOLN.—The strike of masons at Lincoln has terminated, the masters having granted 1s. per week advance in the rate of wages, and the reduction of the time of labour on Saturdays by two and a half hours.

TENDERS.

BEDFORD.—For the erection of house, stabling, and two lodges at Clapham Park, for J. Howard, Esq. (the contract includes fire-proof floors). Mr. T. Usher, architect. Quantities supplied:—

Dover, Dowell, & Co.	£9087
Day	9008
Chappell & Co.	8918
Moore	8909
Colls & Sons	8822
Patterson	8679
Hinton & Young	8659

Estcourt & Co.	8545
Twelvevees.....	8375
Spencer.....	8198
Hobson & Taylor	7963
Foster.....	7495
Watson, Bros.....	7168
Waterson & Co.....	6946

BERKS.—For the erection of infant school, Tilehurst, Berks, for the Rev. J. W. Routh. Messrs. W. & J. T. Brown, architects:—

Grover.....	£240 0 0
Boxall.....	584 0 0
Wells.....	543 0 0
Wignmore (accepted)	457 10 0

BERKS.—For building additional class-rooms to the National School, Tilehurst, Berks, for the Rev. J. W. Routh. Messrs. W. & J. T. Brown, architects:—

Boxall.....	£286
Barnicoat.....	260
Wignmore.....	254
Dormer.....	232
Grover.....	227

BIRKENHEAD.—For the erection of Egerton Dock Warehouses, Birkenhead, for the London and North Western Railway Company:—

Blakeley.....	£31,844
Thompson & Co.....	29,953
Warburton.....	28,180
Farrel.....	27,842
Ross & Woolfenden.....	26,362
Parker & Son.....	25,532
Kirk & Parry.....	25,378
Banks.....	24,300
Johnson.....	24,916
Vernon Capper.....	23,155
Pearson Lee.....	22,942
Holme & Nicol.....	22,505
Bennett.....	22,104
Haigh & Co.....	21,720
Parnall.....	20,991

DUMFRIESSHIRE.—For additions and alterations to Cowhill House, for William Johnston, Esq. Mr. Walter F. K. Lyon, architect. Quantities supplied by Mr. Clement Dowling:—

Johnston & Anderson	£5614
Thomson, D. & C. W.	4323
Macartney.....	4267
Ker.....	4216
Thomson.....	4164
McEwen.....	4147
Halliday (accepted)	4009

GOSPORT.—For the erection of schools for the Rev. Thos. Doyle. Mr. Henry John Hanson, architect:—

Rapley & Son.....	£320 5 0
Cole.....	297 0 0
Lowe.....	249 15 0
Lane & Son.....	225 10 0
Garrett (too late).....	225 0 0
Cooper (accepted).....	224 15 0

Huddersfield.—For the erection of new premises at Huddersfield for Messrs. Pickford & Co. Mr. Geo. R. Isborn, architect and surveyor. Quantities supplied:—

Messrs. Parker.....	£2075 0 0
Booth, Illingworth, & Co.....	2050 0 0
Fawcett.....	1950 0 0
Graham.....	1948 5 0
Graham & Son.....	1901 6 8
Christie.....	1747 0 0
Radcliffe & Sons.....	1698 8 0
Mallinson and Co. (accepted)	1669 0 0
(Ditto for additional works).....	697 15 0

KENSINGTON.—For the rebuilding of three houses on the north side of High-street, Kensington. Messrs. James Broadbridge & Jonah Houle, architects:—

Stimpson.....	£3,295
Foster.....	3,287
Cowland.....	3,089
Temple & Foster.....	3,040
Langmead & Way.....	2,995
Scrivenner & White.....	2,988
Cooke & Green.....	2,905

LEICESTER.—For the erection of a new gas tank, at Leicester, for the Leicester Gas Company:—

Docwra & Son.....	£10,822
Firbank.....	10,750
Aird & Sons.....	10,736
Tomlinson (accepted).....	7,545

LONDON.—For the erection of the Clerkenwell and Smithfield Branch of the London and Joint Stock Bank, at the corner of S. John-street and Charterhouse-lane. Mr. Lewis H. Isaacs, architect. Quantities supplied by Mr. L. C. Riddett:—

Hill & Sons.....	£12,364
Adamson & Sons.....	12,250
Lucas Brothers.....	11,700
Perry & Co.....	11,172
Elkington.....	10,805
Scrivenner & White.....	10,712
Browne & Robinson (accepted)	10,610

LONDON.—For the re-decoration of the two public houses, "The London Apprentice," Old-street-road, and "King's Arms," Beech-street, Barbican. Mr. J. H. Rowley, architect:—

Heaps.....	£542
Main.....	499
J. Hind (accepted).....	485

LONDON.—For the erection of new premises, 108, Bishopsgate-street, for Messrs. Gordon & Co. Messrs. Francis, architects. Quantities supplied:—

Dove, Bros.....	£6375
Myers & Sons.....	5775
Fish.....	5346
Hill, Keddell, & Waldram.....	5237
Merritt & Ashby.....	5229

READING.—For the erection of a coffee-shop, Abbey-square, Reading, for Messrs. Sutton & Sons. Messrs. W. & J. T. Brown, architects:—

Strong.....	£488 0 0
Woodroffe.....	488 0 0
Matthews.....	439 0 0
Sheppard.....	425 0 0
Barnicoat.....	410 15 0

CONTRACTS OPEN FOR BUILDING ESTIMATES.

WISBECH, CAMBRIDGESHIRE, July 35.—For the erection of a Baptist Church and Schoolroom in Ely-place.—J. W. Chapman, Architect, 11, Sutherland-gardens, Harrow-road, W.

STROOD, KENT, July 17.—For the erection of a Vicarage House.—Mr. A. W. Blomfield, Architect, 1, Henrietta-street, Cavendish-square, W.

PADDINGTON, July 24.—For pulling down S. Paul's temporary Church, and erecting new Schools.—J. C. Boys, Architect, 24, Granville-place, Portman-square, W.

Bow, July 19.—For the erection of four dwellings with shops, in Tredegar-road.—C. Chapman, Architect, 51, Bishopsgate-street, Within, E.C.

ST. MARYLEBONE, July 20.—For the construction of a new 12-inch pipe sewer, in Hall-road, St. John's Wood.—W. E. Greenwell, Vestry Clerk, Court House, St. Marylebone.

ARMLEY, NEAR LEEDS, July 22.—For rebuilding S. Bartholomew's Church.—Messrs. Walker and Athron, Architects, 11, East-parade, Leeds.

LEWISHAM, July 19.—For improving Lewisham-bridge.—S. Edwards, Clerk to the Board, Grove-place, Lewisham.

S. GILES, CAMBERWELL, July 9.—For forming and making up new roads near the Wellington public-house, Old Kent-road.—G. W. Marsden, Clerk, Vestry-hall, Camberwell.

GRAVESEND, July 25.—For re-flooring and reseating S. George's Church.—Rev. R. Strong, 25, Cobham-street, Gravesend.

MADELEY UNION, August 10.—For the erection of a new workhouse at Lluceon-hill, Madeley.—H. Beycott, Clerk to the Guardians, Ironbridge, Salop.

TUNBRIDGE WELLS LOCAL BOARD, July 28.—For forming and making the carriage and footways, fixing gullies, &c., in the Albion-road.—T. Lewis, Clerk to the Local Board, Town Hall, Tunbridge Wells.

WAR DEPARTMENT CONTRACT, July 25.—For the erection of a Lecture Room at the School of Musketry, at Hythe.—Royal Engineer Office, Shorncliffe.

BRADFORD, YORKSHIRE.—For supplying and fixing about 1000 tons of east iron work, and about 500 tons of wrought iron work required in the erection of Fireproof Offices at Bradford, Yorkshire.—Messrs. Lockwood and Mawson, Architects, the Exchange, Bradford.

ROTHERHITHE, July 21.—For the erection of Schools, &c.—H. J. Hanson, Architect, Grove End House, Faleon-road, Clapham.

CRYSTAL PALACE PARK ESTATE.—For the erection of a pair of semi-detached villas in the Thicket-road.—Mr. J. Norton, architect, 24, Old Bond-street, W. C.

ROAN'S CHARITY ESTATES, GREENWICH, August 12.—To be let by tender, on repairing leases, the whole or part of the Roan-street estate.—Messrs. Smith and Batchelor, clerks to the charity, 16, Essex-street, Strand, W. C.

HINGHAM, NORFOLK, July 22.—1st tender for buildings consisting of retort house, coal store, purifying shed, lime store, meter, governor house, workshop, cottage, &c., gasholder tank, tar tank, and freshwater cistern, with works to complete the same. 2nd tender, for the erection and completion of four retorts, with retort beds, flues to chimney, &c. Scrubber, condenser, purifiers, gasholder, station meter, governor, and all necessary pipes, with about a mile and a quarter of street mains.—D. Oldfield, 7, Westminster-Chambers, S. W.

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LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.

LEAD.

Pig—Foreign	per ton	£17 12 6	£17 15 0
" English W.B.	do	20 0 0	20 2 6
" Lead Co.	do	18 10 0	18 15 0
" Other brands	do	18 0 0	18 10 0
Sheet Milled	do	18 15 0	19 0 0
Shot, Patent	do	20 10 0	21 0 0
Red or minium	do	20 10 0	0 0 0
Litharge, W.B.	do	0 0 0	0 0 0
White Dry.	do	25 6 0	26 0 0
" ground in oil	do	0 0 0	0 0 0

COPPER.

British—Cake & Ingot	per ton	76 0 0	0 0 0
Best Selected	do	78 0 0	0 0 0
Sheet	do	79 0 0	81 0 0
Bottoms	do	81 0 0	0 0 0
Australian	do	75 0 0	77 10 0
Spanish Cake	do	0 0 0	0 0 0
Chili Bars, cash	do	65 15 0	68 0 0
" Refined ingot	do	72 10 0	74 0 0
Yellow Metal	per lb.	0 0 6½	0 0 7½

IRON.

Pig in Scotland, cash	per ton	2 17 9	0 0 0
Welsh Bar, in London	do	7 5 0	7 10 0
" Wales	do	6 12 6	6 15 0
Staffordshire	do	7 15 0	8 5 0
Rail, in Wales	do	6 15 0	7 0 0
Sheets, single in London	do	9 5 0	10 5 0
Hoops, first quality	do	8 15 0	9 5 0
Nail Rod	do	7 10 0	7 15 0
Swedish	do	9 15 0	10 0 0

TIMBER.

Teak	load	12 5 0	13 10 0
Quebec, red pine	"	3 15 0	4 15 0
" yellow pine	"	4 5 0	5 5 0
Quebec oak, white	"	6 0 0	6 5 0
" birch	"	3 10 0	5 0 0
" elm	"	3 10 0	4 0 0
Dantzic oak	"	4 10 0	6 10 0
" fir	"	2 7 0	4 5 0
Memel fir	"	2 10 0	3 10 0
Riga	"	3 5 0	3 10 0
Swedish	"	2 5 0	2 15 0
Masts, Quebec red pine	"	4 0 0	6 10 0
" yellow pine	"	4 0 0	6 10 0
Oregon	"	7 0 0	9 0 0
Lathiwood, Dantzic, fm.	"	3 0 0	5 0 0
St. Petersburg	"	5 5 0	5 15 0

Deals, per C, 12ft. by 3 by 9in.	"	12 10 0	18 0 0
Quebec, white spruce	"	12 10 0	14 10 0
St. John, white spruce	"	12 10 0	14 10 0
Yellow pine, pr reduced C	"	18 0 0	19 10 0
Canada, 1st quality	"	12 5 0	13 10 0
" 2nd do.	"	12 10 0	14 10 0
Archangel, yellow	"	13 0 0	13 10 0
St. Petersburg, yellow	"	7 5 0	8 0 0
Finland	"	0 0 0	0 0 0
Memel and Dantzic	"	8 10 0	10 10 0
Gothenburg, yellow	"	8 10 0	9 0 0
" white	"	10 10 0	12 10 0
Gefne, yellow	"	8 10 0	12 0 0
Soderham	"	8 10 0	12 0 0
Christiania, per C, 12ft. by 3 by 9in., yellow	"	10 0 0	12 10 0
Other Norway	"	7 0 0	8 0 0
Flooring boards, pr square of lin, first yellow	"	0 9 0	0 10 0
First white	"	0 8 0	0 9 0
Second qualities	"	0 6 0	0 8 0

OILS, &C.

Scal, pale	per tun	33 10 0	34 0 0
Sperm body	"	81 0 0	82 0 0
Cod	"	35 0 0	35 10 0
Whale, South Sea, pale	"	34 0 0	0 0 0
Olive, Gallipoli	"	47 10 0	0 0 0
Cocaoat, Cochin, tun	"	50 0 0	50 10 0
Palm, fine	"	37 0 0	37 10 0
Linseed	"	33 0 0	0 0 0
Rapeseed, Eng. pale	"	44 0 0	0 0 0
Cottouseed	"	28 5 0	33 10 0

BANKRUPTS.

TO SURRENDER IN ENGLAND.

Holden, Howard Ashton, late of Ethelburga House, Bishopsgate-street, builder, July 21, at 12.30.

TO SURRENDER IN THE COUNTRY.

Bland, David, Blackheath, builder, July 24, at Greenwich.

PUBLIC EXAMINATIONS.

August 14, G. Hawkins, Upper Norwood, builder.—July 27, C. Renshaw, Hyde, engineer.

DECLARATIONS OF DIVIDENDS.

J. W. Fletcher, New Wandsworth, timber merchant, div. 5d.—G. Short, Warrington, builder, instalment 3s.

PARTNERSHIPS DISSOLVED.

Holt, Childe, and Holt, Wakefield and Leeds, engineers and surveyors.—J. and W. Cherry, Uxbridge, builders.—Sharp and Evans, Falmouth, painters.—Evans and Morris, Shrewsbury, plumbers.—Robinson and Barberry, Liverpool, painters.—Clarke Rogerson and Co., Liverpool, cement merchants.—Mouey and Son, Newbury and elsewhere, architects.—Fellows and Co., Dudley, builders.—J. and G. H. Lea, Stafford, patent gate manufacturers.—Harrison and Bedford, Huddersfield, engineers.

SMALL-POX, FEVERS, AND SKIN DISEASES.—The predisposition to is prevented by Lamplough's Pyretic Saline. Agreeable, vivifying, and invigorating, its effects are remarkable in their cure and prevention. Take it as directed. Sold by chemists and the maker, H. Lamplough, 113, Holborn-hill.—[ADVERTISEMENT.]

SALES BY AUCTION.

Wokingham, Berks.—To Freehold Land and Building Societies, Trustees of Public Institutions, Builders, and Capitalists.

MR. W. A. BOWLER will **SELL** by **AUCTION**, at the Mart, Tokenhouse-yard, London, on Tuesday, the 25th day of July, 1871, at 2 o'clock precisely, in one lot (by order of the Ecclesiastical Commissioners for England), a very valuable and desirable **BUILDING ESTATE**, containing by admeasurements 29a. 1r. 25p., situated within 200 yards of the centre of the town of Wokingham and the parish church, and about 400 yards from the railway station, from which London is reached in one hour and 20 minutes, and Reading in a quarter of an hour. The property is title free and land-tax redeemed, and is approached by a newly-made road. The soil is light and gravelly, and consequently very healthy, and commanding extensive views, is suitable for the erection of residences of a superior class, or for a public school, or other extensive institution. The estate is so situate, with reference to existing roads, that new roads may be most conveniently constructed in connection with them, and the purchaser will thus be enabled to lay it out in building plots to the greatest advantage. The present tenants are under notice to quit at Michaelmas next, so that possession may be obtained on completion of the purchase. Particulars and conditions of sale, with plan, may be had of Messrs. Jennings, White, and Buckston, solicitors, 8, Whitehall-place; of Messrs. Clutton, land agents, 9, Whitehall-place; of Mr. James Weeks, auctioneer, Wokingham; at the Auction Mart; at the Great Western Hotel, Reading; and of Mr. W. A. Bowler, land and timber surveyor and valuer, estate agent and auctioneer, 7, Whitehall-place, London.

Preliminary Advertisement.—To Builders, Land Societies, Contractors, and Others.—A Noble Residence (unfinished), standing in about 7 acres, and about 46 acres of Freehold Building Land, Villas, and Cottages to be Sold, by direction of the Freeholder, in August next.

MR. SMITH has received instructions to **OFFER** for **SALE**, in August next (of which due notice will be given), the **UNFINISHED MANSION**, delightfully situate, and commanding beautiful and extensive views, in grounds containing seven acres. Seven well-finished Villa Residences, and several Cottages, together with about 46 acres, in convenient plots for building purposes, on the Estate known as "The Alport Park Estate," about half a mile from the Sudbury Station, and only a short distance from Willenden Junction on the London and North-Western Railway. There is an abundant supply of pure water from the chalk, from an artesian well on the estate. The roads and sewers are made, and gas will shortly be laid on over the estate. The great facilities that will be shortly given by the railway company for passenger traffic, upon completion of the fourth line of rail, will render this estate very desirable for investment or occupation.

Particulars and Plans may shortly be had, and in the meantime any information may be obtained from Mr. S. Hickson, Estate Agent, 9, King's-road, Bedford-row, London; or of Mr. Smith, Corn Exchange, Northampton.

Sutton, Surrey.

MESSRS. BLAKE, SON, & HADDOCK will **SELL** by **AUCTION**, at the Mart, Tokenhouse-yard, London, on Wednesday, July 26th, at 2 o'clock precisely, a valuable **FREEHOLD MEADOW**, comprising nearly 10 acres, situated adjoining the Hall Mead Estate and the Public Recreation Ground. The Land is highly eligible for intersection by a new road, and sub-division into numerous building plots. It is nearly adjacent to the high London-road, and is within a few minutes' walk of the railway station, whence the City and West-end are constantly accessible. It is at present in the occupation of Mr. Harris and Mr. Freeman, at rents amounting together to £40 10s. per annum.

Particulars, with Plans, may be had at the Inns at Sutton; at the Auction Mart; of Messrs. Maynard and Sons, Solicitors, 57, Coleman-street, E.C.; and of the Auctioneers, 32, Nicholas-lane, Lombard-street, E.C.; and Croydon, Surrey.

Sutton, Surrey.—To Builders and Others.—Important Building Land, close to the railway station in this rapidly-increasing and improving village, within half an hour's railway journey of the metropolis.

MESSRS. BLAKE, SON, & HADDOCK will **SELL** by **AUCTION**, at the Station Hotel, Sutton, on Friday, 28th July, at 5 for 6 o'clock (by order of Trustees for sale), about 5 acres of the most important and valuable **BUILDING LAND** in the parish of Sutton, within a few yards of the railway station, divided into 21 convenient plots for Private Residences, for which there is now much demand in Sutton since the second line of railway to London through Tooting was opened. The land partly fronts to the high road from Sutton to Cheam and Ewell, and the remainder to Grove and Church-roads.

Particulars, with Plans, may be had at the place of sale; of G. Robins, Esq., Solicitor, 3, Guildhall-chambers, Basinghall-street, E.C.; of W. H. Rowland, Esq., Solicitor, Croydon; at the Auctioneers' Offices, 32, Nicholas-lane, Lombard-street, E.C.; and Croydon, Surrey.

Penge (Laurie Park South).—Valuable Freehold Plot of Building Land, suitable for the erection of two first-class houses.

MESSRS. STUCKEY & WINSTANLEY will **SELL** by **AUCTION**, at Garraway's, Change-alley, Cornhill, on Tuesday next, at one o'clock precisely, a valuable **PLOT** of **FREEHOLD BUILDING LAND**, having a frontage to Laurie Park South of 140ft. by a depth of 200ft., and suited for first-class buildings. Particulars and conditions of sale may be obtained of Jno. C. Onions, Esq., Solicitor, 56, Middle-street, Brig-ton; a Garraway's; and of the Auctioneers and Surveyors, 70, Cornhill, E.C.

WANTED.

Advertisements for "Situations Wanted" are inserted in the "BUILDING NEWS" at a charge of One Shilling for the first Twenty-four Words.

WANTED.—JOINERS used to Gothic Church Fittings.—Apply to Arthur Hayball, Cavendish-street, Sheffield.

A MECHANICAL DRAUGHTSMAN **WANTED**, at Hayward Brothers', Manufacturing Ironmongers, Hot-water and Kitchen Engineers, 79, Cornhill, E.C.

TO ARCHITECTS.—An ENGAGEMENT **WANTED** by a **GENERAL ASSISTANT**, twelve years' experience, good references. Moderate salary required.—Mr. Kedge, 3, Titchborne-street, Cambridge-square, W.

TO LAND AGENTS, BUILDERS, AND OTHERS.—A BUILDER of seventeen years, reduced through losses in trade, seeks a **PERMANENT SITUATION** on a Gentleman's Estate, or under a firm of respectable Builders, to plan and superintend works; well up in all branches of the trade, can make plans, detail and working drawings, measure up and estimate all kinds of works, and conversant with the laying out and planning of building estates.—Address, J. B., Post-office, Lincoln.

TO ENGINEERS & CONTRACTORS.—A thoroughly practical **ENGINEER**, of eighteen years' experience, chiefly in railway works, is desirous of meeting with an **ENGAGEMENT** either to superintend general contracts or bridge-work (iron or masonry), preparing estimates or working drawings, &c.—Apply by letter to A. B., General Post-office, Birmingham.

A PERSPECTIVE DRAUGHTSMAN and **DESIGNER**, accustomed to the General work of an Architect's Office, wishes an engagement. Terms, 2 guineas a week.—Address, C. W., 147, Staley-street, S.W.

AN ARCHITECT'S ASSISTANT desires an **ENGAGEMENT**. Seven years' experience in a first class London office.—Address C. H., 21, Mariau-street, Hackney-road.

TO ARCHITECTS.—WANTED, by the Advertiser, a **SITUATION** in an **ARCHITECT'S OFFICE**. Details, working drawings, perspective, &c.—Address S. W., 6, Queen's-road West, Chelsea, S.W.

TO ARCHITECTS.—An ASSISTANT desires an **ENGAGEMENT** in town or country. Well up in office routine. Moderate salary. First-class reference.—Address, X., Post-office, Birkenhead.

BUILDING LAND TO BE LET.

ROEHAMPTON, SURREY, for detached and semi-detached Villas, also a few Sites for Shops. The roads and sewer made.

ASHFORD, near **WINDSOR**, close to the station, suitable for detached and semi-detached villas.

WEST HAM, ESSEX, close to the Stratford and Stratford Bridge stations of the G. E. Railway, suitable for small property; also some very advantageous frontages with wharfage, suitable for manufacturing premises, or will be sold in plots to suit purchasers. Advances made.

SYDENHAM, KIRKDALE NURSERY, close to station, and adjoining the church. Gentlemen wishing to erect premises for their own occupation will find this a good opportunity.

WANDSWORTH COMMON.—For sale, close to ditto, about 12 acres; part of the purchase money can remain.

Apply to Beeston, Son, and Brereton, Architects and Surveyors, 27, Grosvenor Mansions, Victoria-street, Westminster.

TO BUILDERS.—Eligible BUILDING LAND TO BE LET in several of the best suburban districts, with advances.—John F. Haynes, Solicitor, 3, Warwick-court, Gray's-inn, W.C.

SURREY-SQUARE, OLD KENT-ROAD.

ELIGIBLE LAND to be LET on Building Leases. Roads and sewers are made.—For particulars apply to John Browne, Esq., Stratheden Lodge, Wellesley-road, Croydon; Messrs. Jones, Arkcoll, and Jones, No. 190, Tooley-street; and Mr. Robert Parris, No. 61, Kennington-road, S.E.

ELIGIBLE BUILDING LAND TO BE LET or SOLD, in large or small quantities, in localities within easy distance from London. Advances, if required, to respectable builders.—Apply to Messrs. Kennard and Buck, Architects and Surveyors, 39, Finsbury-circus, E.C.

TO BRICKMAKERS, BUILDERS, and OTHERS.—TO LET, a **BRICKFIELD**, in full work, doing a good business, ten miles from London, the stock on hand can be taken by valuation or remain at option, and arrangement made for the plant if required.—Applications to R. S., Poplar-villa, Beulah-hill, Norwood.

BUILDING LAND.

MESSRS. DRIVER beg to inform the public that they have some exceedingly eligible **BUILDING LAND** TO BE LET ON BUILDING LEASE, and SOLD in the following Districts:—

KEW.—Cumberland Estate, close to the Station and Kew Gardens. Roads made.

CAMBERWELL.—At the rear of the Camberwell New-road Station.

COLD HARBOUR-LANE.—Twenty Acres, close to St Saviour's Church.

EALING.—Adjoining the New Station. Castle Hill Park Estate. Seventy-five acres.

ESHER.—Thirty-five acres, fronting high-road, and suitable for first-class villas.

HANWELL.—Fronting the high-road and near the Station.

NORWOOD, SURREY: BEULAH PARK.—146 acres, well timbered.

DENMARK-HILL, SURREY.—About four acres, well adapted for superior residences.

REIGENTS PARK.—With frontage to the Park and Albany-street, 300 ft. square.

BREAD-STREET-HILL.—Area about 600 feet, suitable for a warehouse.

RICHMOND.—Lansdowne House Estate, frontage on Richmond-hill, the Lower-road, and abutting on the Thames.

MALDEN, Surrey.—230 acres, good frontage and close to the Station.

BETCHWORTH.—Undulated and well-timbered. Suitable for superior residences.

CHOBHAM and CHERTSEY.—Forty-four acres, fronting a high-road.

LEYTON.—Sixty-seven acres. Detached Plots.

LEYTONSTONE.—Thirty acres, close to the Station. Roads and Sewers made.

BOW.—Suitable for small Houses.

TUNBRIDGE WELLS.—The Culverden Estate, adjoining the Town.

TOTTENHAM.—West Green-lane, with frontage thereto, and the high-road. About forty acres.

DITTO.—Hanger-lane. Three acres. Good frontage.

NORTH SHIELDS.—Valuable Building Sites surrounding the Town.

WIMBLEDON.—Seven Acres, adjoining Station.

For further particulars and terms, apply to Messrs. DRIVER, Surveyors, Land Agents, and Auctioneers, 4, Whitehall, London, S.W.

REIGENTS PARK—SITE of the **COLOSSEUM**.—Valuable **BUILDING LAND** TO BE LET, occupying about 81,000 square feet, with about 300 feet frontage to the Park, and also to Albany-street.—For terms and particulars, apply to Messrs. Mayhew, Salmon, & Whiting, Solicitors, 30, Great George-street, Westminster; and to Messrs. Driver, Surveyors, Land Agents, and Auctioneers, 4, Whitehall, London, S.W.

TO BUILDERS.—For Eligible BUILDING LAND near Bristol, apply to W. Cloutman, Surveyor, Exchange, Bristol. Cash advanced if required.

TO MANUFACTURERS & BUILDERS.

LAND suitable for Factories, with plentiful supply of pure water, good roads, and railway accommodation, to be SOLD or LET on Building Leases.—Apply to Mr. E. Littler, Upper Plaistow, E.

GASHOLDER and TANK FOR SALE.

—The Directors of the Croydon Gas Company have FOR SALE, for £550 as it stands, on the Company's premises, Philate, Croydon, a **TELESCOPIC GASHOLDER** and **WROUGHT-IRON TANK**, 80ft. diameter, with twelve columns, girders, inlet and outlet pipes, syphons, and two valves. The Gasholder is now in use, and can be seen, and further information obtained, on application to Mr. C. Farrand, Manager, Gasworks, Waddon, Croydon.—By order of the Directors.

W. J. RUSSELL, Secretary (pro tem).

Offices, 23, George street, Croydon, July, 1871.

ROYAL POLYTECHNIC.—Professor Pepper's "Trip to the Western Highlands of Ireland," grand Scenery, and Irish Songs by Miss Barth.—Engagement of George Buckland, Esq., and Great Revival of Henry Russell's Songs, under his personal kind superintendence, with grand Scenic and Optical Effects.—"PARIS, as it Was and Is," illustrated with a beautiful series of Pictures of the Public Buildings and Streets; by J. L. King, Esq.—Re-engagement of E. D. Davies, the Premier Ventriloquist.—The Ghost and other Entertainments as usual.—Admission One Shilling. Open from 12 to 5 and 7 to 10.

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For particulars apply to the Clerks at the Railway Stations, to the Local Agents, or at the offices, 64, Cornhill, and 10, Regent-street, London.

WILLIAM J. VIAN, Secretary.

THE BUILDING NEWS.

LONDON, FRIDAY, JULY 21, 1871.

THE LEICESTER COMPETITION.

THERE are two surprising things about modern competitions which cannot fail to strike even the ordinary observer. It is surprising that civic authorities, who as a rule know little or nothing about architecture, but who are supposed to be impressionable to the claims of economy, should advertise for competitions at all; and, in the second place, it is surprising that architects of ability and reputation, knowing the rocks and quicksands surrounding competitions, should enter the competitive lists. Advertisements must be paid for, the prizes offered must be awarded, and the referee must be paid his fee. Take, for instance, the Leicester competition, which, in its result, is like almost every other competition. Why did the Town Council go to the expense of advertising, offering premiums, and engaging Mr. Street as professional referee, if they were determined not to follow the advice of the referee? If it were a predetermined thing to engage a local architect, why not have called him in and given him the job without further delay, expense, and trouble? Why ask other architects, living in different parts of the country, to go to the unnecessary trouble of making designs, if the best design is to be cast on one side, and that sent in by a local architect selected? Why call down Mr. Street from London, whose ability is unquestioned, whose time is so valuable, and, as a consequence, whose charges must be corresponding, and then insult him? The whole thing is uneconomical, wasteful, and absurd! A short time since we congratulated ourselves on the prospect of an honourable competition. We saw the competitive drawings, and we called particular attention to the design numbered "1250." In our number for June 23 we said "'1250' shows the best architecture," and we saw in imagination a really beautiful building erected in the ancient town of Leicester—a building worthy of the central position of the town, its historical importance, and its increasing population and wealth. We felt as if Mr. Street would almost instinctively give "1250" the blue riband, and so he did. In his report, written a few days after we wrote, he selected five designs which in his opinion were the best. These were:—

No. 25	Motto "1250."
" 27a	" "Fiat Justitia."
" 30	" "Euge."
" 32	" "Speramus."
" 28	" "Delta."

Speaking of "1250," Mr. Street said: "The architectural character of this design is extremely good. In my opinion there is no other design equal to it in this respect, and it would be a great satisfaction to see so beautiful a design carried into execution." Of "Fiat Justitia" Mr. Street said: "The architectural character of this design is moderately good." He used the same words when speaking of "Euge." Of "Speramus": "The architectural character of this design is poor." And of "Delta" he said: "The architectural character of this design is not very good."

So much for Mr. Street: now for the Town Council. They, in their decision, gave "Speramus" 25 votes; "Fiat Justitia" 17 votes; and "Euge" 14 votes; and "1250" none. The design described by the referee as "extremely good," and of which he said "it would be a great satisfaction to see so beautiful a design carried into execution," is kicked on one side, while that of "Speramus," of which "the architectural character is poor," is awarded the first premium! The

decision is so contrary to common sense, and so oblivious of all ideas of justice, that we wonder that ordinary notions of propriety did not induce the committee to act differently. Now most people will ask what can be the cause of such an extraordinary decision? We do not know, unless it is that "Speramus" was submitted by a Leicester architect, and "1250" by a London architect. We ask the Leicester Town Council, in all fairness, whether if "1250" were submitted by a Leicester architect, and "Speramus" by a London architect, would their decision be the same? We cannot believe it would. And again, we ask, why solicit a competition? Or, if they were resolved to have a competition, why not confine it to local architects, and decide for themselves, without the intervening advice of a referee? As the matter now stands, it looks very much indeed like a job, and such must be the opinion of all disinterested men. But some may say, though Mr. Street said, and though it may be agreed on all hands, that the architectural character of the premiated design is poor, the plan in the opinion of the referee is good. This certainly should be recorded in its favour. On the other hand, Mr. Street is of opinion that the plan of "1250," with three or four exceptions, is good. There is another matter of some importance in this competition, considering the printed instructions as to the estimated price of £25,000 being absolutely adhered to. We see from Mr. Street's report that the design by "1250" contains 1,013,000 cubical feet, and the design by "Speramus" contains 1,135,800 cubical feet. The design by the latter will therefore involve an additional expenditure of several thousand pounds.

The whole matter, therefore, not only concerns the reputation of the Leicester Town Council, but the pockets of the Leicester taxpayers. They may now join us in asking why pay premiums of £200, £150, and £100? Why give a referee £105, when the whole thing could be so snugly settled, as it has been, at home? And they may also, with propriety, ask why spend several thousand pounds more over a poor design than is necessary to be spent over a good one? It strikes us that the matter is so important that the Leicester Town Council have not yet heard the last of it. We must, however, let the people of Leicester take care of their own pockets; we are more concerned in the architectural aspect of the question. Hitherto a majority of our best architects, on account of the proverbial injustice accompanying public competitions, have determined not to have anything to do with them. From this time, on account of the Leicester fact staring them in the face, that resolve will be strengthened. And the result will be that none but third or fourth-rate men will compete. This we regard as a great pity. We think our very best architects should be in requisition when important civic buildings are to be erected in our old historic towns. Such buildings belong to the public, not for this age merely, but let us hope for many successive ages. Their design and erection should therefore be placed beyond the vulgar reach of jobbery.

We must not forget to mention another fact of some importance connected with this business. Have the Leicester functionaries forgotten a document issued by Mr. Stevens, their borough surveyor, and sent to the competitive architects, in which it was stated, "I have also to state that the Corporation have determined on obtaining the assistance of some architect of eminence to select the five best sets of drawings, and to advise with the committee as to the three to be selected for premiums?" Have they taken the architect's advice? In fact, have they not disregarded it? And were not the designs submitted on the express condition that such advice should be followed? We go so far as to question the right—certainly the moral right—of the Corporation to award

the premiums contrary to the advice of the referee. We condemn the decision because it is a violation of good faith—in fact, of precise written stipulations—because it will increase the bad repute of corporate bodies, and because it will diminish the prospects of improved architecture in this country.

MISCELLANIES AT THE INTERNATIONAL EXHIBITION.

IN all Exhibitions there are sure to be innumerable varieties, entering into no particular class, well worth study, but liable, on account of their diffusion and obscurity, to be overlooked. The annexes of the Albert Hall contain a multitude of these objects, which thoughtful and practical visitors will find to repay the trouble of searching for them. Broadly, the entire collection is separated under two heads—Fine Arts and Industry—but no such distinguishing line has been vigorously followed: the subjects of the one are frequently found in the realm of the other; and, of course, there is a neutral ground upon which the double title is claimed by each, as in the filagree enamels, painted porcelains, Gothic wood-work, and Agra mosaics; in the stained glass, the fans—upon which an infinitude of false Watteauism is wasted—the terra-cottas, tapestries, and ivories. We should probably also include in this department the metal work, but that, apart from all processes of manufacture, it is so noble an art in itself. None can have stood in the shadow of the mighty tower at Antwerp, looking at the earliest work of Quintin Matsys—a branched and foliated cross in iron, wrought with one chisel and one hammer—without feeling that the artist in metal may be inspired not less than the painter of Madonnas. It is needless to claim rank for the Ghiberti gates, or for their not unworthy companions of Verona, Pisa, and the Mantuan chapels. It is not that the cross of Matsys is a work of superlative beauty, but that a man of genius had evidently thrown a strong love into that trophy of his youth. It is this, indeed, which sets in one category the metal work of the true artist, and in another the conventional claret jugs, rifle prizes, Doncaster and Goodwood Cups, wine-coolers, mirror-frames, and mock cinque-cento tazzas, of which there are here too many. The statuettes, bas-reliefs, heroic groups, and medallions, in copper and bronze, represent, principally, such merit as may be admired in the shop-windows of Bond-street and Cornhill; but in silver the display is characteristic, because it is chiefly Oriental, not Indian only, since it represents some of the curious ingenuity of Central Asia, whence modern magnificence may be said to have first arisen. The iron and steel-work, inlaid with gold and silver, of the Punjab, is wonderfully elaborate and beautiful. It is occasionally, though rarely, jewelled, those Asiatic experts preferring enamel when they arrived at the proper employment of gems, their singular taste being exemplified by a tiger's claw, which is one flash of diamonds, an elephant goad aflame with ruby and emerald incrustations, and a waist-zone that might have bound the bosom of Nourmahal. In Europe, brasswork has never been held in any great estimation; but it has, especially if ancient, a high estimation throughout the Asiatic and African continents. Curiously enough, the Oriental, while delighting in ivory as a material of art, rarely cared for wood, although it was ready to his hand, of every conceivable quality. Perhaps, however, the very abundance of ivory may suffice, if we seek a reason. The Germans, for exactly the contrary reason, have ever been patient, ingenious, complex, and humorous wood-carvers; the Flemings share their predilection; the English, French, and Austrians turn this process to the decoration of rooms and of furniture rather than to sculpture, strictly so-called. We pass by the ivories—

nearly all modern, the cameos, engraved gems, lithographs, etchings, and photographs, as too multifarious for criticism; with the lace, embroidery, shawls, and silks, as not falling within our scope. In the range of scientific inventions and new discoveries we see the principle of the Patent Laws operating as usual—protecting a number of useful ideas, and holding guard also over a great many eccentricities: a machine for ringing church bells; a boot-blackening apparatus, designed by a convict; a new mode of stuffing tigers; a “skin scratcher,” invented by a Hindu; an electric clepsydra, to time the flight of projectiles, as though the chronograph were not perfect; and an electro-balistic chronograph for the same purpose; a meteorograph, and so forth. In this department, however, there is far more than a fanciful or grotesque dexterity exhibited; much, indeed, that deserves minute scrutiny, from the type of all furnaces—a hole in the earth, a few bits of turf, half a dozen stones, and a hollow reed—to the newest Staffordshire model, and the mighty structures of iron thence, through one workshop after another, elaborated. But we are glancing among the miscellanies, and, as we have said, these are always among the scarcely-noticed treasures of all international exhibitions, except such as are regulated upon that of Paris in 1867, which assigned to everything, however trifling, its place of origin on the map of the world. Thus with these Celtic and Anglo-Saxon relics; reminiscences of Egyptian, Greek, and Roman antiquity adopted by modern art; engraved precious stones, illuminated manuscripts in gold and colours, terra-cotta mouldings, bronzes, majolica, plate, arms and armour, crystals and agates, clocks and watches, trinkets and toys, and table furniture. They are found where least expected—glimmering in dark corners, lurking between the legs of a cabinet, obstructing a corridor, or associated with some other objects with about as much natural or historical relation to them as a Tudor church would have to the Tonga Islands. The Celtic and Saxon antiques are few, though there are specimens from private collections of torques, fibule, bronze spear-heads, stone kelt, jet and glass beads, rings, armillas, breast adornments (such as Juvenal’s Bacchanals of the mortal sort rejoiced in), buckles, shields, belts, knives, tweezers, pins and studs, with cups, urns, and bottles, pilgrims’ signs, and a thousand varieties, niched or cabinetted here and there, which no visitor guided by the catalogues would ever dream of seeking. Greece is not nominally represented, but something of her traditional grace lingers yet in a few works upon which, we learn, Athenian artists, and artists from the Islands, belonging to the present day have been employed—an armlet of gold, fit for Cleopatra; some tazzas, Pagan of outline, but fresh from the chisel, and preserving more than the Classic form; a double-handed scyphus, of the earliest pattern, made from Italian clay, with a border of antelopes, lions, and birds; some chequered mosaics, marvellously reproduced by Parisian artists, in red, blue, and yellow, divided, not by *cloisonné* work, but by metal rings. Specimens of the most singular glass manufacture, particularly of the kind called “pressed,” and of that in which the most beautiful prismatic effects are caused by chemical decomposition of the surface. We are not aware whether this art, or rather trick, is practised in our own days. It is certain that a tendency is shown by the goldsmith, and other ornamental workers of our time have a fondness—identical, we presume, with a turn in the public taste—for reproductions of the quaint designs that were in vogue in ages when self-decoration was little less than a ritual among women—lynx and ibis heads, Egyptian water jars, the eternal scarabæus, a necklet of griffins’ jaws, a bearded bronze mask with golden eyes, an altar of Venus as an ear-pendant, Babylonian and Sassanian seals, tiny Mediæval

dagger-sheaths, consular tablets, and the square coins of Etruria—the last very common now without their possessors being aware of it. In other respects the modern knack of reproduction, and the sympathy accompanying it, may be noted in the collection of electrotypes and metal castings, including faithful models from antique German, Flemish, and French cathedral doors; middle-age arms, armour, and plates; hunting horns such as Rufus might have heard winding in the New Forest; lamps, tripods, sconces, and beakers old as heraldry itself; lanterns that may have hung in the halls of Tintagel; diadems suggesting whole dynasties of fair-headed Saxon queens, and Pompeian bowls, whence Glaucus might have drunk in pledge of Ione. These have their third group in purely new imitations, extending to grace-cups, revivals of the long disused but remarkably fine “strap,” or “cartouche” work, of the fifteenth, sixteenth, and seventeenth centuries, and the pierced metal book-covers, dating from a thousand years earlier. Russia, Austria, and France, as usual, are rich in ecclesiastical gold and silver, in pastoral staffs and croziers, one of the former bossed on the stem with Gothic arches; a ciborium in the shape of a dove, with an opening in the back for the sacred wafer; pectoral crosses, cups, and salvers lavishly luxurious; scripture scenes chiselled in the precious metals, and all things else which would have delighted Solomon and the Queen of Sheba, though the assortments are scattered, and not large. The South Kensington collections of this kind are incomparably more opulent, with their array of chasuble, dalmatic, and tunic, stole, and manipule, and orphrey, resembling the plunder of a cathedral, with all the chests of sycamore and sandal, sculptured and massive, which contained these pompous treasures. It is very desirable that those who explore the galleries of the International Exhibition with a view of analysing and appreciating their contents, should take advantage of the close proximity in which the South Kensington Museum lies, to compare the wealth of the one with that of the other. As containing materials for general study the latter has an unquestionable advantage over the former, though it wants the element of national characteristic and contrast, which, however, in the former, is very incomplete and necessarily so. But both are exuberant with coloured light, cast through painted glass. It is said that Beckford once contemplated writing a book on Painted Windows. Assuming him to have possessed the necessary knowledge, certainly no man could have brought a more glowing or a brighter style to the treatment of his subject, for Beckford’s language was in itself a dazzle of sumptuous tints. It is strange, however, that the great glass inventors and manufacturers of Europe rarely devoted themselves to this art, essentially harmonising as it does with the objects of sacred architecture. The Bohemians and Venetians loved glass as a material to be wrought into wondrous forms, to take deep dyes and gilding; they were rather like goldsmiths, furnishing forth Imperial tables with services of glittering plate in their own chosen ware—goblets, cups, salvers, flower-stands, and vases, emblazoned with the arms of petty German states, and bishoprics in crimson, yellow, purple, blue, flesh-tint, smoke-tint, sun-tint, “snow-drift,” and that which is a light rather than a colour in the heart of the work. But they seldom stained their substance in order to make a picture of it. Our artists exhibit, at the International Exhibition, a genius entitling them to rank with the Belgians, which is saying much. The windows shown in the Meyrick Gallery, throwing their dim religious halo over the ghostly troop of effigies in armour, reflect the highest credit upon English taste and skill. Their subjects are for the most part sacred or legendary—the Annunciation, always supplying scope for splendour; S. Cecily and S. Michael,

which leave the designer more to his own free will; the Parable of the Ten Virgins, an unlimited field for variegation of hue; the Adoration of the Magi, also suggesting grand masses and contrasts of colour; the Nativity, which, again, is generally coloured as if by tradition; and a perspective from Revelations, lurid and painful. The Belgian specimens are, for the most part, Renaissance in style. Some windows should be remarked, painted in grisaille, and others stained in complex patterns. The Belgians, as a rule, prefer painting to staining, which is not so much the case with our own artists; but it may be feared that the highest development of this art was witnessed by generations which have passed away. As in painting and sculpture perfect manipulation may be commanded; but of the genius which made the old makers and masters what they were, scarcely even the comprehension is left, and of their masterpieces how many have escaped the ravages of civil and religious war? Fragments remain in the aisles of Westminster, Wells, Winchester, Salisbury, next in magnificence to “The Abbey” itself, and there are undoubted ancient examples at Canterbury; but these are the most fragile monuments of the human imagination, and there are many who, with grand restorations in hand, believe that the lights and shadows of a sacred edifice should depend upon the natural light and the architecture alone. Not so the Continental nations. When desirous of displaying a church in its complete glory they shroud its windows, even on a midsummer day, and trust to lamps and tables, swinging countless from arch and bracket, and blazing countless on every altar, in every chapel. The glass, we may observe, copied from the choir of Wells, is early fourteenth century manufacture, and contains some noble compositions. These are amongst the miscellanies at the International Exhibition, to which little attention is invited, either by the manner of their display or any prominence assigned to them in the catalogues. We might pass on through other classes—wardrobes such as Paul Féval describes in the chamber invaded by his Three Red Men, with mighty locks, keys, and hinges of engraved steel; furniture solid as a house, and fanciful as a jewel casket; cabinets in the “columnar” style, as the French are fond of terming it; trifles in elegant woods, ornamented with marble and marqueterie; tables big enough for one at which a misanthrope might eat alone; jewel-boxes luxurious as the pearls supposed to rest within their velvet linings; clocks and watches of the most modern build, pointing to that which will indubitably develop into a great rivalry of the future between France, Austria, and England, since the Americans, with their utmost efforts, can produce nothing better in appearance than machine-work, or in mechanism superior to the London-made articles of a quarter of a century ago. But, before leaving these miscellanies, which possess their peculiar interest, though they have to be sought for far and wide, we must turn among what are called “appliances for physical training;” and visitors to whom one batch after another of these novelties reveals itself will be surprised, perhaps, by discovering that “physical training” may be got out of dolls’ clothes, military chess, toy wooden kitchens fitted up, bears in natural skins, moved by clockwork, which growl; a tumbling drummer, and a poultry-yard with leaden chickens. The wonder is that these superfluities of trash are admitted to a place in an exhibition styled “International” by its promoters. But, in reference to this topic, we may remark that there is less of that puerile ingenuity and wasted labour—upon which we have had occasions more than once to remark—among the novelties brought together by working-men than we remember in any former display. Certainly, however, the visitor who would gain a full idea of the Exhibition must penetrate its byeways.

REVIEWS OF RECENT BUILDINGS.

III.—FRENCH AND ENGLISH GOTHIC.

THE class which we have now reached is, as every one knows, that which comprehends the great majority of modern Gothic designs. The Pointed styles of the South, suggestive as they are for some details, especially of our town architecture, are never likely to become permanently rooted amongst us. Their style, though often graceful and refined, fails, on the whole, to suit our climate; and of the many influences which jointly determine the direction of any living and practical style, the influence of climate must always remain one of the chief. Venetian architecture has a value for us as the architecture of a commercial city; it shows us how the Mediæval system can deal with a state of society somewhat analogous to the modern one. This is just what French and English Gothic remains rarely to show us; but then, on the other hand, they show us nearly everything else; and, of the two, it will probably be found in the end an easier task to adapt Northern Gothic to our circumstances than to fit Southern Gothic to our climate and materials. We think, moreover, that its earliest phase will prove the most capable of being thus adapted, and without further preface will proceed to notice some of the instances in which it has been brought into use.

The architectural critic has, at the present day, perpetual reason to lament the substitution of ornament for architecture. Ninetenths of the buildings which force themselves on his attention are hopelessly defective in general design. Without shape or proportion—without picturesque grouping or well-balanced arrangement, they cover themselves with a veil of decoration, and think that nothing else is wanting to make them admired. It is a relief to turn from these tawdry pieces of vulgarity to such a building as Mr. Brooks' Church of S. Columba. So perfect is its contrast to them, that it tends at present to a fault in the opposite direction; and with no carving, no wall-painting, and no stained glass, it cannot at present realise the complete ideal of its architect. The earliest French Gothic style, which in the main is what is adopted, *does* call for some of these accessories to temper its dignified severity. But, in the present state of popular taste, this is plainly the side to which the genuine architect should lean; and after the surfeit of trashy decoration with which our minor church-builders, to say nothing of the Tarrings and Poultons beyond them, have been sickening us so long, we can easily bear, once in a while, the wholesome plainness of such a work as this. There are several characteristics for which it is remarkable, though it says little for the state of our architecture that such characteristics should at this time of day be enough to distinguish a design. It is a brick church, designed for the material; it is a town church, designed for the situation; and it is an Anglican church, designed for the service. The first peculiarity is none too common in modern work, the second is rarer, and the third by far the rarest of all. In plan, S. Columba's consists of a nave, five bays long, entered by a lofty north porch in the western bay; it has two shallow transepts, projecting only a foot or two beyond the aisles; and a square-ended chancel, likewise of no great depth. The middle aisle is 31ft. wide from centre to centre of the nave columns; it contains the whole of the seats, which are thus, with very few exceptions, in view both of the altar and the pulpit. The side aisles, nearly 8ft. wide in the clear, merely serve as passages. The transepts are occupied by the choir, and one of them affords a place for the organ. The bays of the nave are 17ft. 6in. wide from centre to centre of the columns; and, as may be expected from this circumstance, there is a corresponding largeness of scale throughout. Some peculiarities in the arrangement have

doubtless had their origin in the nature of the site. On the south side the church is closely shut in by buildings, on the north is the entrance passage leading to the porch, and the east end stands right out to the Kingsland-road. Hence there are no aisle windows; those of the chancel are placed high above the ground, and the lighting is mainly from the clerestory. This arrangement is effective internally, and useful in keeping out noise. It has the misfortune of making the street front the least attractive part of the whole design; and we really think that the east end, especially in its upper part, is a good deal more unprepossessing than it need have been. The windows in the clerestory are somewhat broad and short, with two plain, pointed lights, and a large cusped circle above; those elsewhere are chiefly single lights, without any cusping or approach to tracery. A central tower, which at present remains unfinished, is to rest on the arches of the crossing; and as the arms of the chancel and transept are none too long to afford the requisite abutment, massive piers, surmounted by circular turrets, flank their gables. The transepts are roofed at a lower level than the nave, and have, internally, pointed barrel vaults of brick with stone ribs. The chancel and the crossing are groined, in the same materials; the nave has a good plain trefoil roof of wood. Both inside and out the walls are faced with red brick. The nave arches are of the same material, of three orders, with a large roll moulding on each; similar rolls are worked on the arches and jambs in the clerestory. Stone is used sparingly, in certain cases rather too sparingly, not only for effect, but, as it appears, for permanence. The stone shafts of the tower arches, for instance, and those which run up to carry the feet of the roof trusses, are, in the greatest part of their length, merely applied against a face of brickwork. At intervals of three or four feet, indeed, short pieces of them are bonded into the wall, and the intermediate lengths are doubtless dowelled or otherwise secured, but the arrangement has a weak and poverty-stricken look which makes us wish that projections of brick had been used instead. There are, except in the east end, no external buttresses, and the aisle walls (of which the north one only is visible) are destitute of any architectural features. But with the central tower once built, the church will be an effective one. Its general mass and outline is picturesque, and the projection of the transepts and porch will more than atone for the flatness of the walls. It stands well above the neighbouring houses, and, in spite of the absence of ornament, will be a striking object. Amongst the churches with which one is most tempted to compare it is that of S. Peter, Vauxhall, built some six years ago by Mr. Pearson. Possibly the comparison is hardly a fair one, since S. Peter's, though by no means costly, is built in a less economical fashion than S. Columba's. But both churches are in poor neighbourhoods, both mainly of brick, both in a nearly identical phase of French Gothic, and both thoroughly well digested in their main design, without any great luxuriance of detail. To Mr. Pearson's design we should award the higher refinement, the more sustained and certain artistic power. Mr. Brooks now and then falls into coarseness of detail, and, while aiming at severity, gives us nothing better than uncouthness. S. Peter's has decidedly the finer interior, as may be expected in a design which has its nave and aisles vaulted throughout; but S. Columba's promises more picturesqueness of external form. In one other respect, however, the latter has the advantage entirely on its side—Mr. Pearson's church is a masterly variation on the Mediæval plan, Mr. Brooks's is designed for the uses of a modern congregation; the former has a large part of its area rendered useless by the nave columns, the latter has scarcely a dozen seats from which the whole service cannot be seen and heard.

AMATEUR PLANNING.

IF there is one department more than another in which the intuitive genius of the public feels itself at home, that department is certainly planning. People who have never handled a pair of compasses in their lives naturally feel some little shyness in dealing with elevations. This shyness, indeed, by a common, if not very elevated, tendency of human nature, often conceals itself under the guise of contempt. They know nothing, and want to know nothing about arches, and cornices, and frippery of that sort—anybody may fill in such things as these—their talent lies in the practical part of the thing—the plan. This plan not unfrequently they will attempt to draw, often to their own ultimate annoyance, and almost always to that of their architect. The man who has worked out a plan for his new house, has, it is true, brought his ideas into shape. He knows, generally speaking, what accommodation he intends to have, and has made up his mind on a variety of general principles. So far, he has been very usefully employed; and to this extent his work will almost certainly tend to his ultimate satisfaction. He is in a position to give what architects far too seldom receive, namely, definite information as to the sort of building he wants. With him it need not be altogether a matter of hazard—as it is with too many building owners—whether his house, as he sees it rise, is, or is not, the one he wanted. If matters stopped here—if he went no further than thoroughly to think over and settle his requirements—his architect would have every reason to thank him. An architect is too often expected not only to carry out his client's views, but to divine them before they are expressed; to find out the wishes of a person who has no clear idea as to what his own wishes are; and to put up a building which its owner will at last discover was what he wanted, though before it is built he will not take the trouble to decide or explain what he really does want. This source of unpleasantness—and a fruitful source it is—will probably be removed by the fact of a client putting his own notions of arrangement on paper. If he is a wise man, he will hand the sketch to his architect as an explanation of his wants; if he happens to be a conceited one, he will give it him as an instruction about the way in which they are to be met. Which he is most likely to do will greatly depend on his understanding the difference between a good plan and a good building.

Did all architecture, apart from detail and decoration, begin and end, as some people seem to fancy, in the invention of a good plan; and were a good plan, as the same people think, merely equivalent to a convenient arrangement of rooms and passages, architecture, instead of being one of the hardest, would be the very easiest of all arts to excel in. The design of a dwelling-house, on this supposition, would require about the same mental exertion, and that of much the same kind, as the winning of a game at chess with an average player. One of the practical puzzles in a boy's magazine would present a considerably harder problem to solve, and the youths of fifteen who master it would be the equals or superiors of a Wykeham or a Wren. Such planning as that of any great architectural work, we may be very sure, would never have emanated from the brain of one of these amateurs. They would have devised what they call a much better plan, that is, one which would look much more plausible on paper, though, unfortunately, it could not have been executed in the materials. They never get so far as to discover that planning has a certain connection, amongst other things, with roofing; and the merits of their arrangements are due, in about 99 per cent. of the cases, to the fact that proportion and constructive necessities have been entirely ignored. These plausible plans make wretched buildings, for, unhappily,

they do sometimes get as far as the building stage. When a rich or influential man happens to be seized with the delusion that he is a clever architect, he seldom stops till he has given the world an unmistakable proof of the contrary. He may be a dilettante prince or nobleman bent on what he calls promoting the arts; and his favourite amusement may be playing at architecture, rather than at politics. Of two evils, the world ought perhaps to thank him for inflicting the less; but his blunders, even in bricks and mortar, are an evil, and one cannot help wishing that they took a more ephemeral shape. He may be an officer in the army (why should the navy never have its turn?) set up by the wisdom of our superiors to design our national buildings, and make believe that they are built without an architect. In this case it will be his duty—and, if he is a gentleman, by no means a pleasant duty—to get his designs made by the ablest architect who will work for him, and then to suppress the designer's name, and allow them to be talked of as his own. The necessity is a disagreeable one, and the whole process, if conducted by common people, might be called by ugly designations. Circumstances, however, alter cases; and every one will see what a dreadfully levelling and democratic effect it would have, to let it be supposed that an ordinary mortal, without powerful friends or family connections, could work for the gods, and help to beautify the Olympus of Kensington. Nature, indeed, has a most reprehensible way of distributing talent, without regard to the "Peerage" or any similar publication, and is sometimes blind enough to link genius to an unknown name, while she spares an illustrious one scarcely brains enough to keep it out of the mire; but if Nature knows no better, there is the more reason why her mistakes should be corrected; and if we cannot prevent her from bestowing eminence on the wrong people, we can at least help to destroy the value of the gift. To join talent to position is, indeed, beyond our power; but we can do the next best thing, we can more or less smother, suppress, and ignore all talent that springs up beyond the boundary line; we can either trample its life out, or dwarf and crush it; or, at the worst, we can appropriate its labours, and give to another man its reward. That every one should get credit for his own productions is a very fine sentiment to work up in a speech or an address to art students; but the "fitness of things," as Mr. Square would express it, plainly shows that such an idea should never be actually put in practice. To patronise science and art is all very well, always assuming that the patronage is kept within the proper circle. Let Captain A., or Colonel B., be the recipients of it; they can easily find some one to do the work for them; and they too, like so many other people, are great at planning; it only remains for their subordinates to make the plans feasible. Unlimited funds, however, and a free use of iron girders will make most plans feasible; and if, in spite of extravagant cost, the result is neither a permanent building nor a well proportioned one, this is merely the price we pay for having aristocratic sham architects instead of ordinary real ones. In our happy land, however, every class is an aristocracy to the classes beneath it, and the very denizens of Olympus might laugh to see how their practices are travestied below. The eminent tradesman, who plays the part of "leading man" on some committee of his class, often patronises art in the very same way as his betters. In some cases he represents in his single person the whole aristocracy of the district, so that no one but himself is worthy to receive his patronage. He therefore bestows it as fitness dictates, and appoints himself architect, or at least "director of the works." He, too, has his ideas. "Some demon whispered, 'Visto, have a taste!'" and a taste he has, in the direction of planning. He gives the committee a "plan," and sees it

carried out by a builder, unless his business happens to be one which enables him to execute it himself. As the works proceed they give him proofs enough that planning and designing are far from being interchangeable terms; his simple plan involves a thousand difficulties and complexities he never dreamed of; and he flounders through his undertaking with every step marked by some bungle or absurdity, which would make any but an "influential man" the standing joke of the neighbourhood. His delusion is gone, it may be supposed; his first experiment in planning will be his last one. Not at all, monomaniacs are not so easily got rid of. The lunatic who believes he is made of glass is not cured by finding that he survives a blow in the ribs; and the one who thinks himself a master of arrangement thinks just the same though all his arrangements fail. But he does learn wisdom by experience, in one respect, and though he will continue to make blunders, he has no idea of continuing to be blamed for them. He will appoint an architect, who shall have none of the control, and all the responsibility. There are plenty of young men to be found who are not in a position to be very independent; he will select one and employ him. We need not detail the rest; the architect's situation will easily be understood. Pestered with one folly after another; forced to carry out the inspirations of his patron, who brings him, with a shout of "Eureka," ideas that an intelligent child might laugh at; with all his advice neglected, and all his designs destroyed, he will be wise if he resigns in time. It will be well for him if he does so at first, and leaves no mongrel product, which the world may fancy is his own. He will inevitably have to do so in the sequel, for he was not employed without an object. Perceiving that he is never left to think for himself, or to carry out his own designs, he may sometimes wonder why his services were ever asked for: by waiting long enough he will discover. When Visto's blunders have at length accumulated so that even his high place can scarcely save him from the consequences, when the very committee begin to clamour that "this really is too bad," he quietly turns round and points to the architect. Well knowing that he has never been allowed the slightest discretion from first to last, with a clear remembrance of his daily protests against the absurdities which he was compelled to superintend, he introduces him to his colleagues as the author of all their calamities. "Here, gentlemen, is Mr. X., who is solely responsible for your buildings, and who will doubtless be able to defend the details which you have so severely criticised; I leave him to settle the matter with you." So the farce concludes. If the architect says nothing, he is dismissed for carelessness and incapacity; if he brings the whole scheme to light, he is dismissed with yet greater haste, for slandering the influential member. No matter though he has proofs in black and white, enough to hang a dozen men, they will not avail him before this tribunal. The committee of the "Asylum for Decayed Cats" cannot afford to blame their leading member? and after showering on him as much abuse as the law of libel will permit, they pass a unanimous resolution to thank Mr. Visto for the care, skill, and attention, which he has so unremittingly lavished in their service.

This is, unfortunately, no fable, but a simple narrative of ordinary facts. But it still has a moral for the young architect, and that is, "Never consent to carry out ideas which you do not heartily approve of." Take pains to form a right judgment, and then stand by it; and let Mr. Visto and his relatives, great or little, perpetrate their own blunders in their own names. It is bad enough to pass a lifetime in producing good work for which some one else receives the honour; it is a great deal worse to pass it in producing bad work of which you will have all the disgrace. It

will not even pay in point of money, for the gain it brings in at first will be dearly purchased by the ultimate loss. For an honest man, the one way of rising in his profession is to do his work well, and, as a means to this, to keep clear of people who want to make him do it badly. Such small profit as can be got out of "Decayed Cats' Asylums," and similar institutions, with a Visto for leading member, it is better to renounce at once. A wise man will decline to sup in the company where such a very long spoon is desirable, and will feel that the paltry remuneration offered does not cover the risk of being victimised by an unscrupulous mock-architect.

SOME RECENT WORKS IN BRISTOL.

IT is both interesting and instructive to revisit any considerable provincial town, after an absence of but a very few years, in this age of change—we hardly dare, without reserve, to say of progress. The evidence of change is more marked in such a town than in the case of the metropolis, in which new works are necessarily more scattered. Again, in a smaller place, where every one is known to everybody, the best men in the place are perhaps more generally employed, or their works become concentrated and easily to be compared. We had not thought it was so many years since we had trod the familiar streets of Bristol, as the date upon the weathercock of a pile of buildings new to us compelled us to realise to be the fact, for 1865 was thus the other day proclaimed—we assume with undeniable veracity—as the year of completion of a structure which arrested our steps. We stopped in order that we might examine the details of a work that we could not but admire in point of general effect. This building, by an inscription, supplied us the information that it was the Temple Church Schools, and an inmate added that it was Colston's. It is very picturesquely situated on the line of the new street to the Great Western Station (Thomas-street). The principal's house faces this street, and has a pretty projecting circular turret at the angle, with another in the centre—a rectangular one, with high chisel-edged roof with good wrought-lead finials. The school is set backward at an angle from the road, leaving a playground in front, and thus the whole group is presented pleasantly and irregularly to view, to the improvement of the street, which otherwise promises, from its rising buildings, to be rather picturesque. The detail of the building is Burgundian Gothic, and the effect altogether somewhat Continental. The architect was Mr. Wood, of the firm of Foster & Wood. The scaffolding having been removed from some buildings in Broad-street, which we remembered to have seen in progress when we last visited the city, and the newness of their stonework having already been toned down, we were enabled to judge at leisure of some of the tolerably recent examples of shop and street architecture, that, interspersed with other older examples of domestic work scattered about this part of the town, give it a more than usually picturesque appearance. Perhaps in general character and degree of excellence these new buildings might be said to correspond with those in the new street through Southwark, in London, and to be vigorous but slightly vulgar, and piquant but a trifle coarse. Right and honest they are generally in point of construction, and err only in lack of reticence and refinement. We may notice in particular No. 51, in Broad-street, by Messrs. Ponton & Gough, as a characteristic and bold example of modern Gothic founded upon a good early type, but a little too ornate for its purpose—a wine and ale storehouse. Its neighbour, the White Lion Hotel, in the round arched style, is a really grandiose and effective building; but the open gallery at the top is somewhat too

light for the remainder, and appears crushed by the cornice above, though substructure, gallery, and cornice are in themselves and by themselves satisfactory enough. The architect in this case was Mr. Foster, of the firm of Foster & Wood. The same upper features are better carried out in the block of buildings belonging to Messrs. Baker, Nos. 50 to 54, in Wine-street, adjoining; and the substructure, save the shop-fronts themselves, is in admirable keeping, and not injudiciously touched with colour and gilding. The whole is spoilt by the architect's undue submission to his employers' commonplace requirement aforesaid, and the massive palatial building is in consequence poised, harlequin fashion, upon huge sheets of plate-glass, as far as the ordinary spectator can divine. In Small-street, immediately opposite the Post Office, are Mr. Pope's New Assize Courts, to which we bent our steps with some interest, remembering, as no doubt many of our readers do, the very picturesque perspective view that was published of them soon after the vexed question as to the selection of the design had been finally settled. We are bound to own that in this instance, as in so many others, the promise of the drawing has not been satisfactorily fulfilled by the building. The general effect is *petite* and undignified, and the details are throughout most commonplace. But worse than these, a gross architectural sin is discoverable from the opposite side of the street, in the bald, flat, ill-proportioned gable of the great hall, which the puny tower and bedizened street façade fails to hide, and the honesty and dignity of the whole as a public building is irretrievably ruined. Many of the features, also, that are ostensibly put forward, are apparently but shams, or so minute in scale as to look contemptible—such, for instance, as the out-corbelled angle turret, not big enough to hold a staircase; and the score or more of tiny pinnacles, which are overlaid with bunchy gablets and crocketing. This, one of the most recent buildings, is certainly not one of which Bristol has any reason to be proud; and its presence causes us doubly to regret the absence of either of the alternative designs for which Mr. E. W. Godwin received his three premiums in the first competition, either of which (they have been illustrated in our pages), we think our readers will agree with us, would have been an ornament and a credit to the city: it is grievous to think how sadly the opportunity has been missed.

In Corn-street, the rich and pretentious Liverpool and London and Globe Insurance Office, by Mr. Gingell, is a sumptuous example of the class of building much affected in Bristol—Renaissance, of the butter-upon-bacon style, with coupled columns, group above group, topped by Caryatides, and these again surmounted by double pediments, one enriched with scrolls and one with figures. The latter are so placed and crowded that from no point can they be properly seen, a matter of but slight importance, as they stand merely for ornament, like the festooned aerial jars around them—mere emblems of money bags.

Wending our way to College-green, we passed the Royal Hotel, by Mr. Haughtin, in which, now that its newness has been worn off, there is not much to object to, save that it overtops and therefore crushes the old and not unpicturesque church alongside of it, and also dwarfs the Cathedral, which not even Mr. Street's additions can make look as if it held its own among its peers. The south wall of the new nave and the south porch are far advanced, the western end only partially, up to the window sills, but the two eastern-most of the six added bays are completed, with their vaulting, and give a good idea of the style of the whole, which is manly and vigorous, in fair harmony with the old work, and yet quite characteristic in detail of its architect; and this is, we think, no small merit. The series of

altar-tomb-like recesses, similar to fine examples in the eastern portion of the church, which occupy the space in each bay of the aisles under the windows, is very happy, though their use is not so evident, and the lofty windows above them, with double series of traceries, is dignified, as also is the porch. What we like least is the treatment of the upper part of the buttresses, which is more flimsy and less able than any of the rest. The stone used for the new work (the Douling) has a good texture and a rich warm tint of colour. Altogether this work promises to be a very successful one. The scaffolding around the tower of Redcliffe Church shows that the restoration of that portion of the structure is still proceeding. As a newly-gilt vane rises above it, we presume the former truncated spire is to be preserved, without any addition to its height. This we cannot but look upon as to be regretted, for it never to our mind appeared other than an incomplete design, and that the spire fully completed would be far more noble, even if slightly less picturesque.

REPORT ON ARCHITECTURAL DESIGNS IN THE INTERNATIONAL EXHIBITION OF 1871.

(Concluded from page 25.)

THE series of English designs for civil buildings, which was commenced by one of Gothic architecture from the pencil of the foremost architect of the present generation, is not inappropriately closed by a Renaissance design exhibited by the present president of the Royal Institute of British Architects, Mr. T. H. Wyatt, who (in addition to other contributions, which will be noticed in their proper places) has contributed a fine drawing of the quadrangle of the Exchange which he has built at Liverpool (3611). This important building is almost exceptional in style, so generally has Gothic been adopted in municipal buildings throughout England. Indeed, to the influence which a single great work exerts over the taste of a city may possibly be traced the fact that Liverpool, which boasts in St. George's Hall the foremost Classic building of England, has chosen Gothic for few, if any, of her subsequent public undertakings. In the Exchange high roofs have been introduced, and the character of the architecture is influenced in many respects by French practice. The building is, however, by no means so richly covered with sculpture as a work intended to serve the same purpose in a French city of equal importance would unquestionably have been.

One architectural design, of no ordinary character, embodied in an actual building, will command the attention of every visitor to this collection, placed as it is within the walls of the Royal Albert Hall. The model of the original design by Captain Fowke is also exhibited, and it may serve to impress on the visitor the inadequacy of any representation of an architectural design to convey more than a faint idea of the executed building, if, after devoting a little time to the study of this model, he will compare the slight impression made by it upon his mind with the effect which a careful examination of the structure itself produces. In the Albert Hall archaeological precedent and modern science have both been called into play, and no structure of our time has so combined the sagacious disposition of plan and vigorous treatment which mark the architecture of ancient Rome with the constructive audacity of the present day. This building presents the only restoration, or approximation to the restoration of a Classical edifice exhibited, and also the only example of those vast roofs of iron and glass which are the direct outgrowth of the building erected twenty years ago for the first International Exhibition. The ancient Roman amphitheatre has contributed the elliptical form, the sloping ranges of seats, the numerous inlets and outlets, the spacious corridors and staircases, and the ample velarium overhead, and has to some extent suggested the nature of the architectural treatment of the subject. The roof, the new use of old materials, such as the external terra-cotta ornamentation, the interior plastering, and especially the mosaic enrichment of the frieze, are essentially modern; so is that part of the interior where tiers of boxes rise above one another perpendicularly. So, above all, is the artificial lighting, and the adaptation of the design of the building to our modern means of illumination by night; these have resulted in the production of effects more brilliant and striking than any other interior in England, perhaps in Europe, can offer, and entirely

beyond what was possible to the architects of Classic times. The original conception of the design was due to the late Captain Fowke, and the point to which he had carried it is pretty well indicated by the model. The matured design, the architectural detail, and the actual construction of this great work, as well as the scientific combinations which have secured its acoustic success, are due to Lieut.-Col. Scott, C.B., to whom are also due the design and the carrying out of the excellent permanent galleries in which the Fine Art Exhibition of Painting and Sculpture is held, galleries which, for practical adaptation to the purpose of displaying pictures, are undoubtedly the most successful we have yet erected.

A splendid architectural work, still in progress, and intended to commemorate the originator of the first International Exhibition, is, from this circumstance, too intimately connected with the present one to be passed over. The Albert Memorial, by Mr. George Gilbert Scott, R.A., lies under the immediate eye of visitors to these galleries. Like the Albert Hall, it was represented at the Paris Exhibition by a model, now in the South Kensington Museum. This memorial, in its general outlines, recalls the form of an Italian canopied monument, and it has received all the enrichments appropriate to a shrine for some precious treasure. It is exactly one of those structures which ought first to be grasped as a whole and then examined in detail, and it is to be regretted that it should be possible for it to be seen, as it is now seen, piecemeal. A rich and noble tabernacle cannot be properly judged of when the sculptured base upon which it stands, and the statue that it is to shelter, can neither of them be displayed. Still, the imperfect glimpses obtainable of the upper portion show so much richness in the architectural details, and an employment so lavish of all the resources for permanent surface decoration which lie at the command of the architect, and the unseen sculpture is understood to be so excellent, that though any attempt on the part of the public now to pass a judgment upon its effect when completed would be premature, this great work of Mr. Gilbert Scott must necessarily count for much when we attempt to gauge the artistic powers of English architects, or to estimate the position attained by their art in comparison with that of other European nations. When completed, there can be no doubt that the Memorial will stand alone among structures of its order.

UNEXECUTED DESIGNS FOR CIVIL BUILDINGS.

The unexecuted designs for civil buildings consist almost entirely of those unsuccessfully submitted in public competition, though some few have been prepared solely as studies; but it comprises several very interesting compositions, and some of the finest drawings, looked at as specimens of architectural draughtsmanship, which have been contributed. Amongst these a foremost place is due to the contribution of Mr. George Gilbert Scott, R.A., who illustrates, by an exterior and interior view, with key-plans, his design submitted in the original competition for an Albert Hall (3707, 3711) in connection with the Albert Memorial. The drawings represent a thoroughly monumental structure, having the character of a mausoleum, and handled with great breadth of treatment; it is interesting to contrast them with the handsome utilitarian structure in which they hang: the practical character of Englishmen is fully borne out by the selection which has been made, but, in the interests of art, it would have been a gain, possibly a genuine step forward in architectural progress, had Mr. Scott's design been carried out. The style is a round-arched one, not strictly Byzantine, Romanesque, or Gothic, but partaking largely of the elements of all three; and if there be any truth in the idea elsewhere thrown out that this is the direction in which progress is most possible for our modern architecture, then this design acquires great value, and had the building been erected it must have exercised no insignificant amount of influence. Mr. Fergusson exhibits a pleasing drawing of his competitive design for the Albert Memorial (3626), submitted in the same competition—a domical monument in a Classic round-arch style, but displaying much Romanesque feeling. It is, indeed, worthy of remark that the architectural characteristics of this design, the work of what is termed a Classic architect, are by no means widely different from those of the design noticed above, and prepared by the foremost architect of the Gothic movement.

The Manchester Town Hall competition is illustrated by several designs. The successful one, by Mr. Waterhouse, has been already alluded to. Besides this, we have a design by Mr. John O. Scott, of which three very fine drawings are exhibited (3663, 3670, 3745). This is Gothic, of French

character, and with much of the dignity and regularity of a Classic composition. An enormous tower, with a two-storied porch, forms the central portion of the principal front, and this porch forms the subject of a separate drawing. It has the large circular shafts and other bold features of early-pointed Gothic. The interior shown is richly covered with decoration. Messrs. Speakman & Charlesworth send several extremely forcible drawings of their design (3579, and five others). The principal front of this example strikingly resembles a Classic composition, but with pointed arches. Many of the features of this design are tinged with the peculiarities of Venetian Gothic. Mr. Worthington exhibits a Gothic design (3761), plain as compared with the last two, but modest and dignified. In the treatment of the roofs there is a great deal of German feeling, which is, however, absent from the masonry. This quality is especially shown in that very picturesque composition, "The Mayor's Porch" (3686), to which justice is barely done by the drawing. Mr. T. H. Wyatt exhibits a design for the same building, of Renaissance character (3607), with high roofs at the angles, and the stories strongly marked.

Mr. J. P. Jones exhibits arched designs of buildings for erection at Madrid and Florence (3614, 3727). Messrs. Banks & Barry exhibit their premiated design for the Foreign Office (3575), and Mr. Sorby a premiated design for the S. Pancras Hotel and Terminus (3730). Messrs. Mills & Murgatroyd send an effective sketch view of their design for the Natural History Museum (3595). In all these instances the architectural style selected is a version of Renaissance. Mr. T. H. Watson exhibits a good design in French Gothic for the London Orphan Asylum (3650).

Lieut.-Colonel Clarke, C.B., exhibits a large and interesting model (3796) of a design for concentrating the Government Offices, by occupying sites west of Whitehall, with lofty and uniform buildings. It is difficult to grasp the idea of such a reconstruction as this, and the model in question will, no doubt, assist those interested in the subject, and unable to "read" a plan or map with ease, to form some conception of how large an undertaking such a concentration might prove. Projects for public works are also shown in a large drawing which Mr. Peddie exhibits of his suggestion for the improvement of Edinburgh (3610); this extensive composition illustrates the direction which an architect's studies must at times take, when a whole city or quarter of a city has to be dealt with. Comprehensive schemes like this, or like the one displayed in Colonel Clarke's model, are often useful, even when they can be only partially carried out, and especially when, as in the present instances, they affect portions only of an existing town or city.

CHURCH AND COLLEGIATE ARCHITECTURE.

Church architecture cannot be said to be adequately represented in a gallery to which no example of this branch of the art is contributed by Scott, Street, Burges, Butterfield, Pearson, Blomfield, Bodley, or Brooks, and where, of the cathedral restorations which are being and have been so largely and magnificently carried out, the only sign is the reredos for Chichester, by Messrs. Slater (3768), unless a beautiful drawing, from the same architects, of Sherborne Abbey, as restored (3758), may be said incidentally to illustrate the subject.

New cathedrals are still from time to time attempted, though they are often but modest buildings compared with the old ones. Of these Mr. Emerson sends the Anglo-Indian Cathedral of Allahabad (3751), a design in very early French Gothic, but not round-arched; and Mr. Goldie, the Cathedral at Sligo (3704), a round-arched plain building, with a bold tower, lighted up by a rich doorway. Messrs. Holden & Son contribute to the same class a design for the Cathedral at Lille (3608), which obtained a premium in an international competition, where the first prize was also carried off by English architects—Messrs. Clutton & Burges.

Good examples of English ecclesiastical Gothic, without any admixtures of foreign features, are offered by Mr. Joseph Clarke's Bishop Stortford Church (3688), and Mr. Phipson's S. Mary's Tower Church, Ipswich (3699), and Chapel of Ease at Harleston (2705). It is not difficult to trace more or less of the influence of Continental Gothic in most of the other churches exhibited, of which some of the most prominent are Mr. Anderson's proposed church (3695); Mr. Joseph Clarke's Hoddesdon Church (3621), a brick design with a gabled tower; Mr. Goldie's Kensington Pro-Cathedral Church (3674); Mr. Glover's Congregational Church (3685); and Mr. William White's brick church for Highbury (3638), distinguished by its rich surface decoration in diapered patterns, and by picturesque grouping. Mr. Marrable, Mr. Peachey, Mr. W. Young, Mr.

St. Aubyn, and other architects are also contributors.

Of the collegiate buildings exhibited, Spring Hill College (3619, 3633), by Mr. Joseph James, deserves notice as an executed example of purely English Gothic. This is one of the buildings which may be described as the fruit of the labours of Pugin and his school; it was built not very many years ago, yet its freedom from French features or detail already appears remarkable when it is hung side by side with the productions of the present day. Mr. Waterhouse's Caius and Gonville College, Cambridge (3600), is a plain version of the French transitional style of Francis I.'s time, and will serve to illustrate the adaptability of that picturesque architecture to modern purposes, and helps to mark our progress in assimilating styles. This design displays some Gothic feeling; it has mullions and transoms, visible roofs and the arcaded cornice characteristic of its style, while the adjoining palladian portico shown in the drawing serves well to indicate how much our architectural ideas have altered within a generation. Mr. Aldridge, Mr. Glover, and Mr. Plumb exhibit school buildings of a type which is very characteristic. The buildings of which these are specimens are largely built in England, and are designed for the most part under conditions which enforce economy, but permit a good deal of attention to be paid to the picturesque in their composition. Mr. Somers Clarke's Swan Downer's School (3631) is strongly marked by a picturesque adaptation of features from Flemish sources. In his Asylum at Snaresbrook (3704*) the same architect has departed largely from precedent or prescription, and these severe buildings may be taken as a type of a somewhat large class of modern architecture, much of it the work of men of cultivated tastes, which, by its studied avoidance of ornament may, perhaps, serve as a corrective to that partiality for exuberant decoration which has seemed to be one of the features of the worst architecture of the day. In the chapel of this building (3702) the architect has shown that he knows how to employ ornamented features where he considers them admissible.

DOMESTIC ARCHITECTURE.

Domestic architecture has a strong hold in Great Britain, and much of the wealth gained by our merchants and manufacturers is constantly being expended in the erection of dwelling-houses in town or country, where it is generally desired that convenience and comfort shall be combined with architectural character. There is a stronger temptation to adopt mixed or transitional architecture in the case of these buildings than in any other. This is partly on account of the tenacious hold retained by the Elizabethan style, our English transitional, upon the sympathies and tastes of very many; but there can be no doubt that so long as a dwelling-house remains what it ordinarily is—namely, a receptacle for furniture in which the peculiarities of several countries and various epochs are mixed up together, it is the safest course to adopt a not very strongly marked style for the building. An almost palatial form of English mansion is exhibited by Messrs. Banks & Barry in their Bylaugh House (3591), built in 1849. The style of this is French Renaissance, very much tinged with Elizabethan feeling. The roofs are not shown, as they probably would have been had the design been made to-day; but in other respects it does not differ greatly from what would be now executed. Mr. E. M. Barry exhibits Crewe Hall (3666, 3701, 3726), a fine Elizabethan mansion which he has restored after a disastrous fire. The staircase, and especially the hall, are good specimens of interiors, and are worth examining as examples of the style. Mr. David Braudon's mansion at Bayham Abbey (3581) shows a general adoption of Elizabethan features in an entirely new work, of which the arrangement is evidently modern and luxurious, and includes a specimen of garden architecture in its terraces. Mr. Fawcett, in Long Stowe Hall (3714), adheres more closely to the shapes and disposition of masses which, in addition to the transoms, mullions, gables, and other features characterise all the old Elizabethan compositions, and which are not always easily available for modern purposes. Of transitional character, but with French (Francis I.) features, is the brick mansion exhibited by Mr. T. H. Wyatt, recently erected in Park-lane (3749), and the importance of which deserved a more adequate drawing.

Pure Renaissance, like pure domestic Gothic, has its representatives among the designs for dwelling-houses. A design for a palace to be erected in Kensington Gardens (3721), exhibited by Mr. Massey, is a grandiose palatial composition, in which the architecture of the terrace is almost as conspicuous as that of the building; but the whole may be taken as a fair specimen of the most ambitious class of Italian palazzo.

Mr. E. M. Barry's mansion on the Grosvenor Estate (3643) shows modern French Renaissance practically applied to the better class of domestic work; while a design of Mr. C. H. Thomas (3612) may be mentioned as showing an extreme version of that style applied to the same purpose, but with certain peculiarities very much exaggerated, though not more so than can perhaps be seen in actual practice. Smaller designs for Renaissance domestic work are exhibited by Mr. Fogerty, Mr. Sorby, and others.

Turning now to Gothic dwelling-houses, we find a very considerable number of contributions, though but few of them represent buildings of great extent; the most palatial by far is Eaton Hall (3797), of which Mr. Waterhouse sends a model (executed by Mr. Thwaite). This, which is to a large extent the recasting of an old mansion, is a very extensive but somewhat symmetrically balanced pile. The disposition of the masses may, of course, be well displayed by a model like this, but its scale is too small to admit of the architectural detail being appreciated. The same architect exhibits Easseye (3637), a Gothic mansion entirely in brick, and showing some of the peculiarities of brick architecture. Of manorial houses adhering pretty closely to the types their architects have selected, Mr. Crawley exhibits an example in his mansion in Hertfordshire (3594, 3662), of brick with stone dressings. Mr. Edis exhibits Buckden, a similar brick-built mansion (3668) of good domestic character; and a third, Greenhurst (3680), is sent by Mr. St. Aubyn, of which the same may be said. Mr. Alfred Smith and Mr. Risley exhibit Castle Carr (3592), an effective group, showing what is now rarely attempted, a castellated mansion. Though not strictly domestic work, the Bodegas (3710) of Messrs. George & Vaughan may be here referred to as a picturesque, well-considered design of simple Continental domestic Gothic, shown in a taking drawing, and evidently well suited to the circumstances of the case.

Crawfordton House (3656) and Newtonaird House (3765), by Messrs. Peddie & Kinnear, and Westerlie House (3635), by Mr. Milne, are examples of Scotch baronial architecture as now practised in Scotland.

Of the more modest type of English dwelling-houses the two frames of drawings exhibited by Mr. Wilkinson (3627, 3742) display good specimens. These drawings are worth notice for their very careful draughtsmanship. Other exhibitors are more or less successful, but Messrs. Wadmore & Baker (3716, and five others) deserve mention for their series of executed works, mostly of half-timbered English Gothic character, shown by photographs, with the aid of key-plans. Mr. Young exhibits some picturesque lodges (3760), and Mr. Douglas a group of farm buildings (3636).

In houses like the foregoing, where some phase of Gothic character is strongly marked, decoration and furniture ought to be carried out with the consistency and completeness aimed at by Mr. Talbert in his interior elevation of a dining-hall (3642). The treatment appropriate for the interior of mansions of another type is shown by the drawings of Mr. Schloy (3737, 3750) and Mr. A. Stevens (3677, 3693). Another study, both of structural and decorative work, is an iron staircase appropriately designed, which Mr. Aitchison exhibits (3703).

DRAWINGS.

In addition to many drawings which have no technical value beyond their representing some building or feature with more or less fidelity, and which could hardly be considered here without its becoming necessary, for consistency's sake, to include all the oil and water-colour paintings of architectural subjects, we have a few specimens of architectural studies properly so called. Of these Mr. F. P. Cockerell contributes by far the finest in his "Laborare est Orare" (3625), a composition of singular beauty of execution. Specimens of the way in which an architect actively engaged in the practice of his art must recruit and extend his stores of knowledge are exhibited by Sir M. Digby Wyatt, who has filled with the contents of a sketch-book, kept by him during a recent tour in Spain, six frames closely packed, in which will be found graphic sketches of many features of the architecture, &c., of that picturesque country (3708, 3713, 3754, 3756, 3763, 3766).

Mr. Longfield sends laborious restorations of the tomb of Henry III., at Westminster Abbey (3593, 3683), and of the Shrine of Edward the Confessor (3684, 3692), in the same building. The patience and care shown in these drawings cannot be spoken of too highly; into any archaeological questions which they may raise this is not the place to enter. Equally good are Mr. Judge's less forcibly coloured studies of the famous mosaic pavement at Canterbury (3681, 3687), which is shown as a whole, and

by details of portions to a larger scale. These drawings may serve to give to the general public a glimpse of the nature of that patient and almost affectionate study which has been bestowed on the remains of ancient Mediæval art by numbers of students; such study, and such study only, has rendered possible the perfection to which modern Gothic architectural work has been carried. The results of academic instruction are exhibited by Mr. Florence, Mr. Lee, Mr. Watson, Mr. Spiers, and Mr. Vials, in drawings which in many cases will repay careful examination, and of which several have received the medals and other rewards of the Royal Academy and of the Institute of Architects.

AUSTRIA.

Austria is less inadequately represented than any other Continental state, but still her contributions are scattered and imperfect. The most important of these is a portfolio contributed by H. R. v. Ferstel (3770), one of her foremost architects. This includes photographs both of the designs of the Votive Church at Vienna and of the building itself. The "Votiv Kirche" is the most important church displayed, as an architectural design, by any exhibitor; it is an elaborate work in florid Gothic, almost resembling a cathedral in richness and scale, and, although the style is not one towards which English sympathies have leaned, few will hesitate to recognise here the hand of a master. A grand scheme for a museum of art and natural science, of Italian Renaissance architecture, is also included. So is the Hungarian "Akademie der Wissenschaften," a large and slightly irregular pile of buildings in a fine style of florid secular Gothic. Another set of these photographs represents the Renaissance palace of the Archduke Victor, a design of perhaps less originality than the others, but of great merit. With these are sent several smaller designs, making up a good and varied representation of the work of an architect of European reputation. F. Schmidt exhibits his new "Rathhaus" (Town Hall) at Vienna (3774), of stately formal Gothic, but a fine mass. It is to be regretted that this design, which was successful in a great European competition, is not shown on a larger scale, especially as the character of the architecture is unusual to English eyes. The same artist sends a picturesque view of his restoration of Burg Carlstein, in Bohemia.

S. R. v. Hanseu sends a folio of designs for an academic building for Athens (3772*), and photographs of the building itself and some of its details, taken during progress. The style is Ionic, and there seems much Classic feeling as well as Classic correctness in the beautifully-executed drawings, and in the fragments of detail photographed.

In the Education Department a portfolio of plans for four sets of school buildings, signed by the same architect, is exhibited (6264). Of these a "Lehre Pädagogium" is well shown by plans and an exterior perspective; the arrangement is, as is common in plans of good Continental architects, very well studied; the few architectural features, which are of a simple fenestrated Renaissance character, just suffice to relieve the building from absolute plainness. Much the same may be said of two sets of designs for a "Bürgerschule," of which one exhibits a sensible, plain use of semi-circular and segmental headed arches. The remaining design is a block of buildings in brick, of simple, dignified, unostentatious semi-Gothic character. The community of Pesth exhibits twenty-two photographs from drawings of school buildings (6269); these are mostly simple; the elevations are in a very plain description of Renaissance architecture. A very complete set of carefully prepared plans of the Chemical Laboratory in the University of Pesth (6270) is also exhibited, no architect's name being appended. The design is of quiet, but good Classic character, and the arrangements are most thoroughly carried out in every detail.

A glimpse at the general aspect of the public buildings of Austria is afforded by three frames of small but clear photographs exhibited by Frankstein, and hung in the corridor near the refreshment room. The frequent adoption of Renaissance architecture, and the prevalent air of refinement and masterly treatment which are characteristic of these buildings, will not escape notice.

BELGIUM.

J. Hoste, of Brussels, sends, in a complete set of plans, his competitive design for the Vienna Town Hall (3784). These drawings give a better idea than the small sketch of the successful competitor (Schmidt, Austria) how extensive a building is proposed. The character of the architecture is French Renaissance, founded very much on the new part of the Louvre; a vast domical feature marks the centre of this building.

The Education Department contains a portfolio of executed school buildings in Belgium, collected by Blandot (6268). They are buildings of moderate size, and their chief peculiarities, as compared with English school-houses, are their greater compactness of plans, their being cut up, when extensive, into smaller rooms, and their being frequently two-storeyed. As architectural designs they are almost all destitute of that picturesqueness by which an English school-house is so often rendered the ornament of the village. One church architect, Carpentier, exhibits. He sends the Church of St. Pierre, Tournay (3653), a well-grouped plain brick church, severe almost to a disdain of ornament, but large in its conception. This drawing serves well to illustrate the difference between foreign and English draughtsmanship. It is careful, severe, and evenly tinted, but devoid of dash or feeling. Much the same may be said of the other contributions sent by this architect (3782).

ITALY.

The original drawings illustrating Gravona's monograph of Monréale, to be found near the Sauchi Tope model, are too remarkable in execution to be passed over without a word of mention.

NORWAY AND SWEDEN.

The early architecture of Norway and Iceland is illustrated by characteristic specimens of Runic ornament, well copied and displayed among the reproductions (3984, 3992). Recent architecture is exhibited only in school buildings. A slight but cheerful wooden structure, too slight to be quite a faithful transcript of the architecture of a timber district, has been erected in the grounds (6352); and here, among other things, plans for a School of Art, by Colonel Stahl, and a Royal Polytechnic Institution (6352), by Colonel Scholander, are hung up. They are of Renaissance character. More interesting is the simple but artistic school-house for Kilanda (6345), shown in the same spot. Here also are some models, intended chiefly to elucidate arrangement of school-houses and their adjuncts. Herr von Hanno exhibits a well-prepared set of school plans.

INDIA.

Many contributions illustrative of the marvels of Indian architectural art are included in the present display. The most remarkable of these is, of course, the full-sized reproduction of the gate of the Sanchi Tope (3981a), showing, as it does, how rich in sculpture in high relief, as well as in surface ornament, good Indian work often is. Photographs illustrative of the caves of Ellora and Ajunta, architectural sculpture from Tanjore, Trichinopoly, and other localities were to be found among the first instalment of objects displayed; and to the number of these large additions will be made before the close of the Exhibition.

Of European buildings and works, such as will mark the poverty of our artistic instincts and education, contrasted with those of our Hindu and Mahomedan subjects, the less shown perhaps the better. The lowest point of the scale is touched by some drawings of school and other buildings exhibited. True, they are executed by native draughtsmen, but they are too unmistakably British for the source of the artist's inspiration to remain doubtful. Better things, however, are included. The Elphinstone College, Bombay, and the Engineering College, Poonah, are among the buildings photographed, and they possess a definite architectural character: so does Mr. Emerson's fountain at Bombay (3679); and these may be taken as representing a group of public buildings commenced during the Governorship of Bombay by Sir Bartle Frere, in which an attempt was made to introduce, as appropriate to Indian requirements, architecture of a character at once simple and bold, drawn from Western Gothic sources, but modified to suit the materials and the climate of the tropics.

The various schools of art in India have sent favourable specimens of architectural draughtsmanship as learned by their pupils.

In closing this notice (in which some foreign contributions, which are catalogued, but up to the time of going to press had not been hung, are necessarily unnoticed), it is impossible to avoid an expression of regret that one express aim of this Exhibition—that it should be International—has been missed in the architectural section in 1871. The Exhibition is, however, to be annual as well as international; and there will, therefore, occur an opportunity, if foreign architects will embrace it, for this defect to be remedied in succeeding years. A smaller amount of drawings from Great Britain might suffice, were they mostly representations of current works to display the architecture of the year; and if the custom

arose of exhibiting in this gallery good geometrical elevations with key-plans, together with photographs of the completed buildings and of their most important details, and were the same description of drawings and photographic explanations also contributed from Austria, Belgium, France, Germany, Italy, and other European countries, the means of an international comparison of architectural work of the most interesting kind would be furnished. In such a friendly contest there can be no doubt that Great Britain would assume and could maintain a high position, notwithstanding the great merits of the architecture of her rivals, and the admitted skill, learning, and taste of Continental architects.

PLEASURE—HEALTH—INSTRUCTION.

WE beg to call attention to the proposed excursion of the Architectural Association to Ely and neighbourhood, to commence on Monday, the 31st of July. For particulars see Mr. Quilter's letter elsewhere. The excursion to Lincoln last year, under the guidance of Mr. Edmund Sharpe, was attended with marked success, and we anticipate a similar result this year. The Ely district is full of interest to architectural pupils and amateurs, and those of our readers especially who wish to extend their knowledge of church architecture should, if possible, join the party. Although the excursion is nominally that of the Architectural Association, no one is excluded who takes an interest in the subject, as Mr. Sharpe's invitation is a general one. No expenses are incurred by those who attend, except those of board, lodging, and carriage, which are contracted for on the most economical terms, so as to bring the cost per head, for the entire week, below £4. Those who neglect this opportunity of enjoying a combination of pleasure, exercise, and instruction, will probably be sorry for it.

BOOKS RECEIVED.

The New Elements of Hand-Railing. By ROBERT RIDDELL, Philadelphia. Seventeen additional plates, for subscribers only. London: Trübner and Co.

A SECOND EDITION of this work has been rendered necessary. A hint given to the author by one of his correspondents, shortly after the appearance of the first edition, set him to work revising his book. He found it necessary to throw out a number of plates, replacing them with new, embodying the perfect elucidation of the problem of producing the bevells for the joints upon the board itself from which the mould is cut. For the convenience of those who have purchased copies of the first edition, the publishers offer, at a reduced price, the seventeen plates and pages of printed matter which are added in the new edition. Mr. Riddell, who had shortly before arrived in this country, called recently upon us, and expressed his wish to meet or correspond with all desirous of a better acquaintance with his system of hand-railing. His address is to be found in our advertisement columns.

Practical Tables and Rules for Steam Engines, by H. HAEDICKE, Under Engineer in the German Navy (London: David Nutt), is what its title implies. The publication in England, by an engineer of the "German Navy," of such a book is, we suppose, the earnest of Teutonic superiority at sea in the days to follow the Battle of Dorking.

The Designers' and Draughtsmen's Handbook of Ornament (London: Dean and Son) strikes us as being of very little use for the class it is supposed to be intended for. The designs are comparatively few, and the matter might have been judiciously curtailed, to make room for more designs, by striking out the semi-historical portions.

Powers in Motion, by JAMES ARMOUR, C.E. (London: Lockwood and Co.), is a concise yet thorough examination into the principles of the general laws that govern power in motion. These essential principles are so explained that the means for the performance of work under ordinary circumstances may be readily selected, and their value accurately estimated. The simplicity of the calculations employed will recommend the book to many workmen who would be deterred from its perusal by the elaborate problems so dear to the hearts of some authors.

Atchley's Builders' Price Book (London: W. Kent and Co.) is rather late in the year in making its appearance. The prices, however, are corrected to May last, so that, for the next few months, it may possess a slight advantage over its more punctual rivals. The book is more serviceably bound than in former years; otherwise (except in the name of its publisher) it appears much the same.

ON THE HISTORICAL DEVELOPMENT OF ORNAMENTAL ART.

DR. G. G. ZERFFI delivered the thirty-ninth lecture of this course in the Lecture Theatre, South Kensington Museum, on Tuesday afternoon last. Having given a graphic description of the times of Henry VIII. in England, Francis I. in France, and Charles V. in Germany, and drawn attention to the influences which a public life full of striking contrasts must have had, the lecturer remarked that in the ornamental parts of the Church of Tewkesbury, in the angels and apostles of Westminster Abbey, and especially in the over-ornamented chapel of Henry VII. (1502—1509), we recognised the stiffness of a degenerated style. We had before us a kind of Gothic Alhambra work. The fault of these works consisted in the artists having overstepped the boundaries of symmetrical proportion. The octagon font of the Church of Walsingham, on the panels of which the Crucifixion and the Seven Sacraments were represented, was an exception, being executed in the very best style of the school of Peter Vischer. Germany, at this period, in the north, had concentrated all her artistic powers to glorify rationalism. In the south, as the stronghold of Roman Catholicism, imagination had been chiefly cultivated. In the south altar-pieces had been carved and painted, as also choir-stalls, of which those of Ulm were the richest, and surpassed in grandeur nearly everything that had been accomplished in this kind of Medieval church furniture. The decorative elements were all taken from the Old and New Testament, mixed, however, with the intellectual representatives of heathenism. We had Pythagoras, Cicero, Terence, Ptolemy, Seneca, Sibyls, Prophets, and Apostles, carved in dignified forms. Finials, baldachins, and cornices abounded, with all the usual motives of the style. To make the work thoroughly effectual, Jörg Syrlin, the sculptor, had given us his own and his beloved wife's portraits. The works of art of this period had had an aim—that of once more glorifying the threatened hierarchical powers of the Church. The Madonna with the Child, and Christ in his youth, had been preferred to the gloomy representations of the Crucifixion, or the harrowing scenes of the Last Judgment; though a taste for sensational pictures and ornamentation had not then altogether died out. Nuremberg, Augsburg, Munich, and Vienna, had had their own schools working in the direction of ecclesiastical art; but the current of ideas had been too strong even for them, and armour, head-pieces, cuirasses, and shields were decorated with mythological figures. The head of Medusa predominated. Kentaurus and Hercules had superseded St. George and the Dragon. Bacchus, surrounded by nymphs and satyrs, adorned tankards. This had been brought about at Augsburg by Strauss. Munich had been under the powerful influence of Krafft, who excited our admiration as one of the greatest Christian sculptors of Christian subjects, and, as such, standing as high as Michael Angelo. The seven stations on the path to Golgotha surpassed anything we knew of as a connected cycle of scenes from the life of Christ. The dead Redeemer in the arms of His mother, who was represented in the act of pressing a last kiss on the sealed lips of her son, was divine, and at the same time human—an artistic petrification of the Christian religion. With regard to English art, the lecturer said that before entering upon this subject, he could not do better than quote some observations made by M. Taine, the Professor of the History of Art at the Collège des Arts et Métiers. "A man of the middle classes," said M. Taine, "entered a shop or an office very young. He had to work ten hours a day, and often on going home worked again; he employed all the powers of his intellect and body for the purpose of making money. He married and had many children, and then had still more work to do; competition was brisk, the climate hard, and the wants great. A gentleman rich and noble had also very little time hanging on his hands, he was busy, and had to perform very grave duties. Politics absorbed every one's thoughts. Meetings, committees, clubs, newspapers like the *Times*, which brought a volume to be read every morning, figures, statistics, a heavy mass of undigested facts had to be taken in, attended to, and directed. Besides these, important religious matters, foundations, enterprises, an everlasting striving to improve public and private affairs, never-ending money questions, questions of superiority, conscience, utilitarianism, or moral discussions, formed his intellectual food. This was the reason that painting and arts, which addressed themselves to the sentiments, were discarded or occupied only an inferior position. People had no time to occupy themselves with art, they thought of more important and more pressing matters, and if they took it up, did so merely because it was the fashion and custom. Art was

treated as a mere curiosity, and just furnished an interesting study for some amateurs. Patrons might be found who would give money for the foundation of a museum, for buying original drawings, or for establishing schools, just as for any other object—the propagation of the gospel, a hospital for foundlings, or for the cure of epilepsy. These protectors or patrons would consider public as well as social interests; they believed that music softened the people and diminished drunkenness on Sundays, that drawing would make excellent designers for calico patterns or jewellery. Taste, however, the feeling for beautiful forms and charming colours, which was the fruit of a careful education only, was wanting, or existed like an exotic orange painfully forced in a hot-house at great expense, and yet generally sour and musty. The contemporary painters were painstaking working-men, very exact and accurate; they would paint a haystack excellently, and would reproduce the folds of a dress, or a shrub, with extreme dryness and offensive detail. The continued effort, the everlasting strain on their moral and physical machines, had disturbed the balance between their sensations and imagination. They were insensible to the harmony of colours, they poured pots of parrot-green on their canvasses, and made their trees of zinc or iron plates. They painted the human body with a red like bull's blood. Except in the study of physiognomies and moral characters their paintings were 'shocking,' and their exhibitions presented to foreigners a mixture of sharp and discordant colours as offensive as a *Charivari*." This, continued the lecturer, was the opinion of one of the most accomplished French art critics and historians, upon whom the University of Oxford had conferred an honorary degree, in recognition of his great merits. It was not his (the lecturer's) province to find fault with this harsh judgment, but to point out what, if it was correct, should be done to alter such a state of things. To infuse ideas, to cultivate the mind no less than the hand was our paramount duty. It was not necessary to have nightly rows and brawls, as in the times of Cellini, to form good artists, nor were intoxicating liquors an essential element in the education of a great painter. Schools did not undertake the duty of bringing out Raphaels and Titians—such men developed themselves from the atmosphere in which they lived, absorbing the intellectual powers of their age, and reflecting them in their works. This was to a great extent the case with Cellini, as ornamentist, and with the whole school of those Italian masters who formed the brilliant focus of Renaissance art—a focus emitting rays of such magic power that they illumined the works even of those who were merely imitators. The spirit of colour had left Italy during the seventeenth and eighteenth centuries, and had settled in France and the Netherlands, whilst the productions of England and Germany especially graced the nineteenth century. Arabesques might be best studied in the works of Raphael, Giulio Romano, Cellini, and Goujon, who had to thank Italy for his artistic education, and who was a real master of relief. In studying the works of these artists we found those laws of beauty, without which no genuine work of art could exist, carefully observed. Those laws might be concentrated in the one word *proportion*. Modern artists often transgressed this law by filling up every nook and corner with ornament, without at all considering the beauty or necessity of so doing, as if their only object were to cover every inch of space. We might say that Bernini had been father of this style of sentimental exaggeration. French artists delighted in muscular development in male figures, whilst in females they affected a smooth softness and sensual refinement. Before Raphael the figures had been emaciated and half-starved; through Bernini they had become well-fed, and even "drowsical," as Winckelman had it. During the times of Louis XIV. and Louis XV. French art had been partly too naturalistic or too idealistic. We could not deny that France had taken the lead from those times in refined ornamentation and polite literature. But the exclusively "Versailles Art" had degenerated by degrees into an enervating sensualism, against which we had had a wholesome reaction in England and Germany. We had turned towards an earnest study of the antique, in Germany, through Andrew Schlüter; whilst England had devoted herself to a correct appreciation of home life. We had had new schools with classical tendencies in Germany, which had fostered great aspirations for historical paintings, whilst in England a painter like Hogarth had taught us moral truths, and awakened in the masses a sympathy for colours. The paths of beauty and morals were the same, they both led to a correct understanding of those immutable laws which governed the universe.

The next lecture will be the last of this year's school session.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.

MR. HENRY NEVILLE, of the Olympic and Adelphi Theatres, at the last meeting of the Society for the Encouragement of the Fine Arts, gave a lecture on the "Stage," with its relation to the fine arts, its origin, influence, and present position; and, having shown that, if properly applied, the drama is a great art, capable of doing universal good, dwelt upon the importance of a national theatre, where the public might learn to appreciate that which is noble and great, and not merely go to be amused for the passing moment. There is, he said, now too much "bread and butter" acting, so many taking to it not for *itself*, or from the feeling which makes the art precious to the artist, because it is his art, but only as a means by which to gain their daily bread. The importance of a recognised school or academy in the other branches of fine art is acknowledged by the present age. The Royal Academy at once raised Joshua Reynolds to a title; music has done so for Michael Costa and Jules Benedict, and why should not the drama give us a Sir William Macready? There are many scholars and gentlemen in the profession, and why should they not have that position in the world of art due to worthy members of such a grand and noble profession as the drama. The lecturer gave some very eloquent and appropriate recitations and stories during his reading, and Mr. Tom Taylor (who presided), Mr. Walter Laeay, and Mr. Ward joined in the discussion which followed; and, though these gentlemen differed in opinion as to whose fault the present system was to be attributed, they were unanimous in respect to the desirability of having a national theatre and school, but not necessarily managed, as some assume, by a "disappointed author" or "unsuccessful actor," which must be evident to every one versed in such matters.

A cordial vote of thanks was given to the lecturer by acclamation, there being over 250 visitors at the meeting.

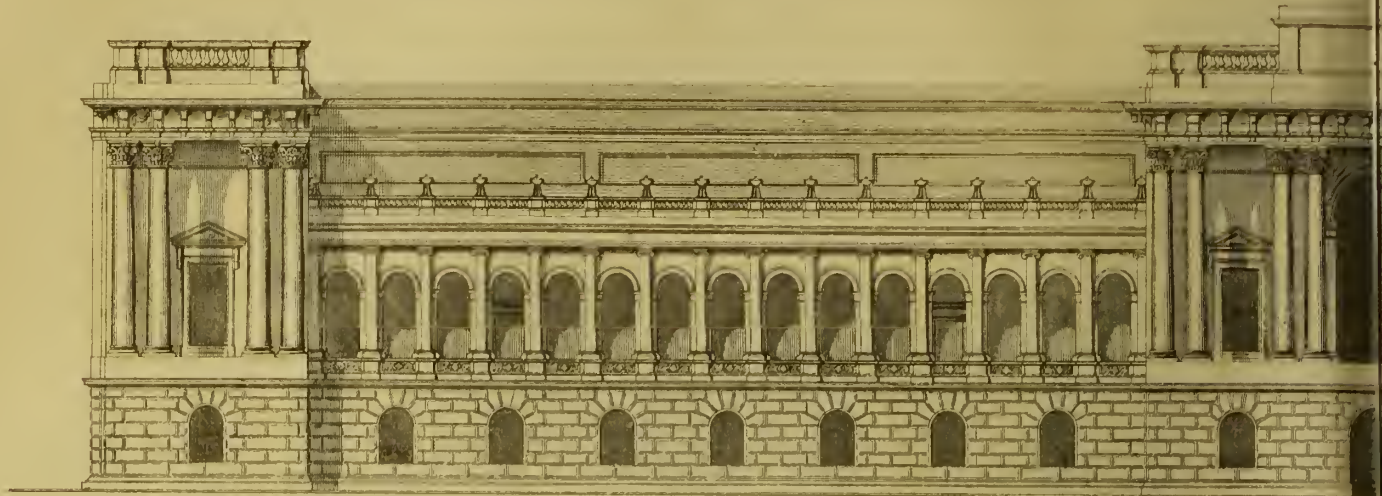
THE ALEXANDRA PALACE.

AT last the project for the utilisation of the Alexandra Park and Palace is assuming the aspect of a sound and business-like undertaking. The prospectus now issued (and which appears in full among our announcements) would seem to render the word failure a foregone impossibility. To quote a few of its leading features, we would mention that each subscriber, or rather Tontineer (who, by the way, incurs no liability, as it is a trust matter), has for his payment a certificate entitling him to admission to the Palace and Grounds, secures a chance of obtaining five prizes of £500 each in an art-union, and participates at the close of the Tontine in the proceeds of the sale of the property. If, too, he is desirous of providing against every contingency, he may nominate a life, and an insurance office will, for the consideration of the payment of 1s. for every 21s., agree to refund 20s. of each such 21s. should the death of the life so insured occur before the close of the Tontine in 1886. To the inherent beauties of the Palace and Grounds, are to be added innumerable amusements and attractions, and the directors will, in the provision of these, be actuated by a desire to develop the views of the late Prince Consort, and furnish entertainments for the cultivated few and the unlearned many. The concern itself is, therefore, intended to be a paying one, and as all the profits are to be devoted to the improvement of the property, the prospects of the Tontineers are indeed full of hope. We may as well state in the usual terms of a prospectus, that the railway communication with all parts is perfect, and will thus render this attractive spot a resort of untold numbers.

COMPETITION.

BIRMINGHAM.—Last week the Birmingham Town Council met to award the premiums offered in competition for designs in the new Corporation Buildings. In his report sent in as referee on the 8th of April last, Mr. Waterhouse selected the design marked "Perseverantia" for the first premium and those marked "Forum" and "In Uno" respectively for the second and third. Subsequently his attention was drawn to a design marked with a Maltese Cross, and that he finally considered was the best. The Council ultimately determined to award the premiums in accordance with Mr. Waterhouse's first recommendation. The successful competitors are (Perseverantia), Mr. Yeoville Thomason, of Birmingham; (Forum), Mr. W. H. Ward, Curzon-chambers, Paradise-street, Birmingham; and (In Uno), M. L. De Ville, 3, Duke-street, Adelphi, London.

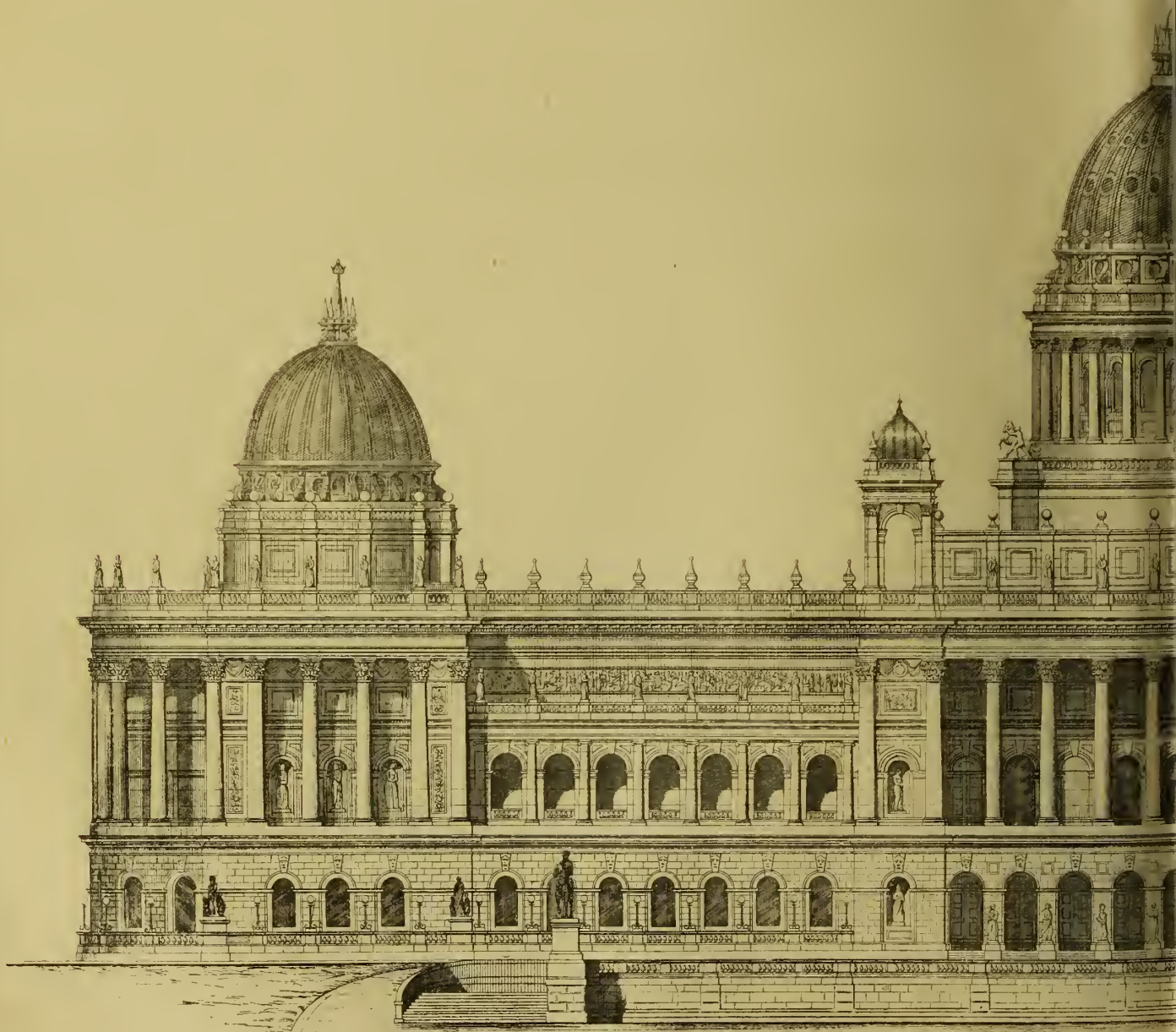
NEW NATIONAL



DESIGN PREPARED BY THE RIGHT HONORABLE A. H. LAYARD W. S. P.

ELEVATION TOWARDS THE

W. S. P.

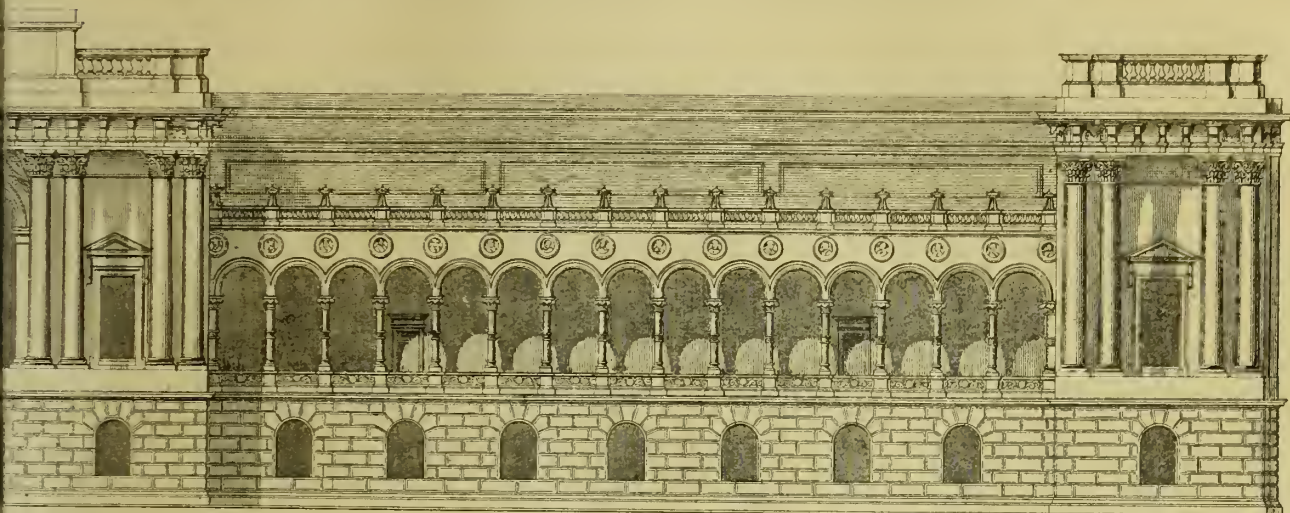


DESIGN PREPARED BY M^r BARRY A.R.A.

SOUTH ELEVATION TOWARDS TRAFALGAR

5 JULY 21st 1871.

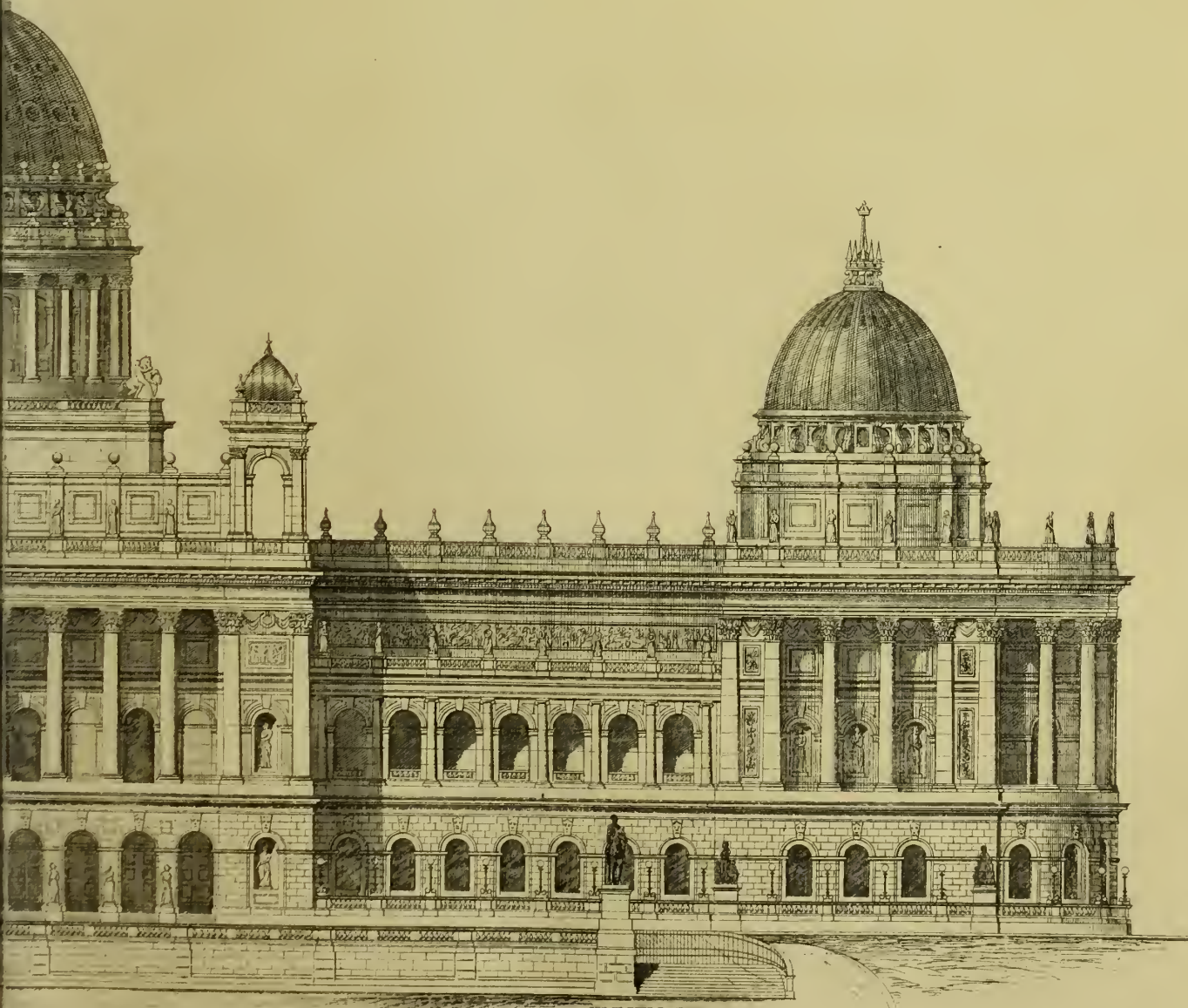
AL GALLERY



THE ASSISTANCE OF GILBERT R. REDGRAVE, ARCHITECT.

FALGAR SQUARE.

SCALE OF FEET



SQUARE

SCALE OF FEET

THE NEW NATIONAL GALLERY.

AS long ago as June, 1868, we presented to our readers the perspective view of the design prepared by Mr. E. M. Barry in the competition for the New National Gallery, and on the 16th of that month Mr. Barry was duly appointed the architect of this important building. It will be remembered that in the month of February, 1866, twelve architects had been invited to take part in a limited competition for the National Gallery, and on the 1st of January, 1867, ten of these architects sent in their designs. An influential committee of judges was thereupon appointed to report upon the merits of the designs which had been submitted, and after a most careful and painstaking examination of the works they declared themselves unable to recommend any one individual design for adoption, though they were of opinion that the one prepared by Mr. E. M. Barry had exhibited the greatest amount of architectural merit. The original conditions were issued during Mr. Wm. Cowper's tenure of office as First Commissioner of H.M. Works; but as Mr. Cowper was succeeded by Lord John Manners in July, 1866, the report of the judges is addressed to the latter gentleman. Before the publication even of the above-mentioned report, the competing architects on the 16th February, 1867, having apparently learned that the judges were about to refuse to nominate any one of their number to execute the work, protested against the unfairness and breach of faith contemplated in this decision.

It appears, however, that no written undertaking had been entered into to employ the successful competitor, and as Mr. Cowper was no longer in office, Lord J. Manners could not be bound by any verbal arrangement supposed to have been made by his predecessor. Mr. Wm. Cowper, indeed, wrote to his successor to point out to him his view of the matter, which coincided with that of the competing architects, but no written proofs of any kind could be adduced.

The report of the judges, to which we have referred, is dated Feb. 28th, 1867, and it was, as may well be imagined, followed by much angry correspondence and ill-feeling, and a considerable amount of sparring in Parliament. The upshot of all this appears to have been that on the 29th of March Lord J. Manners stated that he intended to consult the trustees of the National Gallery before deciding on the adoption of any plan. Here the matter rested for some time, and nothing more was done till June in the following year, when, in consequence of the appointment of Mr. Street to carry out the New Law Courts, Mr. Barry obtained the New National Gallery as a sort of compensation for the loss of that work, to which the decision of the judges fairly entitled him. Mr. Barry at first refused to take this view of his appointment, but it was enforced in the clearest possible way in a letter from the Office of Works, dated June 26th, 1868. In June, 1868, Mr. Layard, as one of the trustees of the National Gallery, prepared and published a pamphlet setting forth his views upon the subject, and with the assistance of Mr. Gilbert R. Redgrave, he illustrated this pamphlet with plans and elevations of the designs which he proposed. On the 24th of October of the same year Mr. Barry was called upon to furnish the Office of Works, with plans, drawn to a small scale, of the National Gallery, and he was instructed to avail himself of the report of the trustees of the National Gallery of Messrs. Banks and Barry's plans for a gallery at Burlington House, and of Mr. Layard's pamphlet. On the 9th of November, 1869, Mr. Barry, having completed this preliminary work, forwarded his drawings, together with his report upon the plans, to the Office of Works, and he then appears to have been called upon to furnish the First Commissioner with approximate estimates of the cost of constructing

certain portions of this design. The official correspondence, as set forth in the various Parliamentary returns called for by Mr. Beresford Hope, is anything but creditable to the subordinates of the Office of Works, the tone of many of the letters being unnecessarily offensive. It would seem that, owing to certain misunderstandings between Mr. Barry and the Office of Works, with reference to the Houses of Parliament, in December, 1869, he was asked to send in his account to the First Commissioner for his services in preparing these preliminary drawings, and that it was in order to obtain copies of the correspondence which then ensued that Mr. Beresford Hope moved on May 22nd, 1870, for a continuation of the Parliamentary return which had been made on the 10th of March in the previous year. Owing to some rather singular misunderstanding Mr. Beresford Hope did not obtain the desired information, but was presented with Mr. Layard's pamphlet, certain documents, and drawings which in no way related to the subject of his motion. On the 25th of July, therefore, he expostulated with Mr. Ayrton, the then First Commissioner (Mr. Ayrton came into office at the end of the year 1869), and that gentleman promised to publish the letters and explain the reasons for the publication of the return in the way it had been done. These various returns which are now before us, and especially the second of them, two of the illustrations in which we this week place before our readers, contain much valuable information, and, when taken in connection with the history of the work, throws a good deal of light upon matter about which very little would otherwise be known.

The elevation of the National Gallery by Mr. Barry is the one originally prepared for the competition in 1867, and the one above it an enlarged drawing of the illustration to Mr. Layard's pamphlet.

Before proceeding to make any remarks upon these drawings we may remind our readers that Mr. Layard drew up his pamphlet previous to his appointment as First Commissioner, and before any definite steps had been taken by Mr. Barry to carry out the work—in fact, before the appointment of the latter gentleman as the architect of the building. Mr. Barry's design has more than once been reviewed in our columns, and our readers will remember that the chief grounds upon which we took exception to it were its resemblance to certain well-known London buildings, and the absence of any marked characteristics pointing out its objects and uses. In fact, it has more the appearance of a magnificent town-hall than of a picture gallery. Mr. Layard's views and intentions with respect to the work are ably set forth in his pamphlet, which is, as we have stated, reprinted in the Parliamentary paper to which we have alluded. He begins by disclaiming any "practical experience in architecture," and states that "the plans he has prepared, with the assistance of Mr. Gilbert Redgrave, are founded upon a long consideration of the subject, an acquaintance with the principal picture-galleries of Europe, and a knowledge, as a trustee of the National Gallery, of its requirements." Mr. Layard says: "The considerations and principles which have guided me in proposing these plans are the following:—That whether the present site in Trafalgar-square be or be not the best adapted for a National Gallery, the decision of the House of Commons on this point is irrevocable. That the present building cannot be altered so as to become a public edifice worthy of the site and of the nation, and fit for the proper exhibition of the collections which we now have, and are likely hereafter to possess. That the style should be Palladian or Italian Renaissance. That in erecting a building on the site of the present National Gallery special regard should be had to its position, forming, as it would, one side of a great square,

and the culmination point of a long rise, and that it should consequently be a grand, massive, and imposing structure, distinguished not so much by elaborate details and ornaments as by just proportions, well-disposed masses, and the utmost variety that can be produced consistently with simplicity in the general design, by colour in the materials, and by the play of light and shade. That the building should 'tell its own story,' i.e., that it should bear unmistakable evidence, by its external architecture, of its use and object. That the decorations, internal and external, should consist rather of materials valuable on account of their beauty of colour and rarity, and of the skill and labour which it may require to obtain and employ them, than of elaborate and expensive ornaments and of exterior sculpture which does not suit our climate."

After these general observations Mr. Layard goes on to explain his plan, which we hope to publish shortly, and in explanation of the façade, an elevation of which forms one of our illustrations. He remarks that "the principal difficulty to be overcome in dealing with the front, or façade, is to convey the idea of a picture-gallery, and at the same time to break the monotony of, and to give variety and 'accentuation' to, a continuous wall, which must necessarily enclose galleries without windows and lighted from above. I would attempt to effect this by a solid basement, constructed of rusticated blocks of large proportions,* to contain the offices and various apartments required for the purposes of a National Gallery. Upon this basement I propose to raise an upper story to be divided into three principal masses united by colonnades or 'loggie,' surmounted by a terrace, and by a receding ornamental screen. In the three masses which would project beyond the line of the loggie, I have introduced columns and pilasters. This arrangement would give three distinct projections in the line of the façade, and would consequently produce well-defined masses of light and shade. Above the loggie I propose that there should be a terrace in front of the receding wall or screen which would conceal the skylights of the galleries behind, and form, with the loggie, a line of connection between the centre and end masses. This screen would help to define the object of the building, and might be made a handsome architectural feature if decorated with pilasters and coloured marbles, bas-reliefs, or terra-cotta ornaments. It must be remembered that as this screen could only be seen from a considerable distance, bas-reliefs, sculptured figures, or details would scarcely be distinguishable. The columns and pilasters of the centre and end masses should be monoliths (about thirty feet high) of Scotch or Irish polished granite, pink being used for the detached columns and gray for the pilasters. A beautiful and valuable material of British origin, which is proved to stand the atmosphere of London, would thus be appropriately introduced. The treatment of the central and terminal masses must depend upon whether a dome or cupola is considered to be essential to the building. This is a question of some importance. The arguments in favour of a dome are: that it breaks the monotony of a long horizontal line, and adds dignity to the edifice: that it would be a striking object, whether seen from Parliament-street, or on approaching the building from the west by Pall Mall; and that it would very appropriately surmount the entrance and central hall. The arguments against the introduction of a dome are: that it is not a necessary, but, on the contrary, a somewhat incongruous architectural feature in a building destined exclusively for a picture-gallery; that it cannot be of sufficient size and importance to make it a really imposing object;

* These blocks should be as large as possible in order to give dignity, simplicity, and strength in the lower part of the building.

and that it would throw shadows which would interfere with the light of some of the galleries."

Here we must for the present conclude, but we trust to revert to the subject again shortly.

THE COMPLETION OF S. PAUL'S CATHEDRAL.

WE recently recounted the suggestions made by Mr. Street for the adornment and utilisation of our Metropolitan Cathedral. A letter has this week reached us from the Restoration Committee, and we reproduce so much thereof as may serve to show the difference between the scheme contemplated by the committee, and that suggested by Mr. Street. The details of the former are briefly as follows:—

1. The enlargement of Father Smith's organ and its division into halves, to be placed opposite each other, north and south, against the piers of the dome, at the entrance to the choir.

The organ thus enlarged and divided will have the appearance of two distinct organs, but will be connected by electric or pneumatic apparatus running under the floor of the choir, and will be played by one organist. This arrangement, the committee believe, will prove an accession not only of musical power but of architectural beauty.

2. The continuation to the verge of the dome area of the present finely-carved woodwork of the choir benches and stalls.

This improvement will give seats to those of the cathedral dignitaries at present unprovided with them, and will furnish permanent accommodation for the larger choir necessary for dome services—thus superseding the unsightly and temporary erections of deal and baize now in use.

Beyond and above these alterations and rearrangements lies the great work of the decoration of the walls, roofs, and windows of the cathedral; and this, from the vast dome to the smallest panel, is a task requiring the greatest circumspection and care. Happily, Sir Christopher Wren's declared intentions, concisely as they are expressed, give no uncertain indication, and these will be consulted at every step. The meanness of the apse will be redeemed by that "altar-piece of the richest Greek marbles, with wreathed and sculptured columns supporting a canopy hemispherical," which he projected, and which nothing but a lack of the requisite materials hindered him from erecting. Throughout the rest of the building, mosaic, marble, and gold will, without doubt, be the three chief materials of ornament; the first and last for the dome and roofs; the second for the walls, columns, and panels. In the two former, speaking generally, the treatment will be pictorial; in the three latter, richly decorative. The best art, wherever it is to be found, will be chosen; and, though the artistic difficulties are great, the artistic opportunities are greater, and promise a result of beauty unsurpassed in our cathedrals. But, besides the artistic difficulty, there is the financial difficulty. This does not appal the committee, but they must fully consider it; and, until generous contributions give some earnest of its removal, they do not feel themselves warranted in going a great way in this part of their work. Some way they have gone. It has been decided to convert the finely-carved woodwork and the marble columns which formed part of the screen removed in 1860 into an interior porch for the north door. This is now being erected, and will not only be useful and ornamental in itself, but will utilise some wood carving far too beautiful to be thrown on one side. A design for a screen which shall divide the choir from the dome, but whose open columns and light entablature shall be no hindrance to sight or sound, while they will supply an architectural need, and conform to ecclesiastical tradition and custom, is under consideration. The fine series of Munich windows in the apse, executed after Professor Schnorr's designs, is being proceeded with. The present committee do not consider Munich glass at all a necessity throughout the cathedral, but as three of the apse windows are already completed in this material, it is requisite that the remaining three should be of the same class. With respect to the pictorial ornament of the walls and roof, the committee have consulted Mr. Burges, an architect, pre-eminent in his knowledge of ecclesiastical decoration, and have obtained from him a report suggesting a series of subjects for representation, their attributes, and their distribution over the spaces of the cathedral. Without pledging themselves in any way to the adoption of the report, which they have not yet considered, the committee may say that in splendour and magnificence it is worthy of the building for which it is intended. Beginning at the west end with mosaics

in the cupolas of the nave roof, representing the earlier scenes in Bible history, the series of subjects advances eastwards in gradual and growing sequence. The transition from the nave to the choir is the transition from the old to the new dispensation; loftier themes are illustrated, till from the concaves of the eastern apse shines a figure of our Lord surrounded by angels. The great mosaic in the dome is the climax of the whole, and represents the Heavenly Jerusalem. Saints and angels lead the eye and the heart upwards, till the cupola closes in gold and azure glory. The committee have not yet deliberated upon this scheme, but, whether they adopt it or another, it is certain that none can be definitely entertained until the public shall have given some security for its cost.

PLASTER OF PARIS MANUFACTURE.

THE quarrying of gypsum and the manufacture of plaster are important industries in Paris, and we (*Engineering*) have recently taken the opportunity of visiting one of the establishments of this kind, the best arranged—that of M. Morel, at Montreuil. The Plaster of Paris, or gypsum, consists, as is well known, of hydrated sulphate of lime. The water being removed by roasting, the stone is ground into powder. When this is afterwards mixed with water it combines itself again, and forms a solid mass, which is employed in an infinite variety of ways. The abundance of gypsum at Montmartre, Pantin, Menilmontant, Belleville, Charonne, Montreuil, &c., all close to Paris, even within the city limits, the good quality of, and the large demand for, the plaster, and the ease with which it is employed, have caused the development of this great industry in the capital. The Plaster of Paris has a European, and even a still more extended reputation. It is employed everywhere, and is put to the most varied uses. It is moulded into hollow bricks, and tubular blocks, in building up partitions and walls, for paving slabs, and for smoke conduits to chimneys. One sees, even in the neighbourhood of the quarries, houses of three and four stories, which are built in moulded sheets of plaster, or made in plaster in such a manner that they form a monolith.

The bed of gypsum worked at Pantin is horizontal: it has a thickness of 3ft. 2in. There is also a small bed adjacent, and of little thickness, but this is not quarried as a rule. The gypsum of this bed is almost entirely crystallised, and there are found there, in abundance, those beautiful specimens called *fers de lance*, on account of their form. These fragments split with ease into thin transparent leaves and when the apparent limit of divisibility has been formed with the blade of a knife, if one takes one of the leaves, which has less than 1-80 in. of thickness, and heats it, it exfoliates into more than twenty films, as the water it contains is heated and disengages itself in steam.

The bed of gypsum that is excavated is covered by some 40ft. of earth consisting of calcareous deposits, and marl and clay. It is excavated, for the most part, by subterranean galleries, but it is sometimes found more economical to work from the surface, in spite of the great thickness of superincumbent earth, because there are numerous situations where the excavated material employed to fill elsewhere can be made a source of revenue, while the limestone can be sold to make lime, and the clay to make earthenware, or bricks.

It is thus that the quarry of Eprissette, worked at first in galleries by M. Morel, is changed at the present time into open excavation.

The gypsum is extracted by blasting. Holes are pierced in the rock, which, for the most part, is sufficiently soft for a workman to drive in less than an hour a hole from 4ft. 6in. to 6ft. deep and 2ft. in diameter. After a blast, the rock is struck with crowbars, which divides it into blocks from 30 to 40 metres cube, advantage being taken of the numerous faults in the material, which the workmen learn to recognise at a glance, and which they call "*mail-lances*." A heavy blow, or the introduction of a pick, at the right spot, divides easily the largest blocks into convenient fragments.

These fragments are loaded upon trolleys, which follow the face of the gallery or cutting on tramways, and which lead up to the eight furnaces composing the factory. These kilns, or furnaces, are of the simplest form. They consist of an end wall 15ft. long, and of two side walls of the same length. The three walls are also 15ft. high, and the square hearth that they surround, carries perpendicularly to the end wall, five gratings, through which passes the air necessary for combustion. On the ground, the largest blocks of gypsum are arranged in such a manner as to construct above these gratings arches sufficiently high to receive the fuel for burning the

material. The spaces intervening are filled up with other fragments of rock, more of which is added from above, so that the height of the mass is raised. When the greatest height conveniently attainable by hand is reached, the charging of the kiln is continued from trolleys brought upon inclined planes which are also supplied with rails. This is carried on until the height of the charge is equal to that of the walls of the kiln. All the interstices are then carefully packed with small fragments of the stone, and the front of the furnace, which is raised by a low wall, receives a movable cover of plate iron intended to prevent the loss of heat by radiation; and to retain such morsels of stone as become detached during the operation of baking; the joints in the front of the kiln are luted.

Everything being then prepared, fagots are placed within the arches and lighted, and when the embers are in full glow and the arches half empty, they are charged with briquettes of artificial fuel, and the fire is so managed by regulating the access of air, that the baking of the mass is effected equally throughout without any extremes of excessive or imperfect burning. The operation is complete in 24 hours.

The employment of briquettes is one of the improvements introduced by M. Morel into his establishment. The baking was generally done with wood, and the substitution of coal has effected a saving of two-thirds of the total quantity produced. There is a comparatively small loss of heat in this apparatus, so simple and apparently so primitive. In calculating the calorific power of the quantity of fuel consumed, and the amount of heat necessary to evaporate all the water contained in the gypsum, it is found that he utilises one-half of the available heat, which is certainly a satisfactory result, considering all the various losses inseparable from an identical enterprise.

After the calcination is complete, the furnace is allowed to cool, and the burnt gypsum is again loaded into wagons and carried off on the tramway to the grinding mills. This part of the manufacture consists of two parts. There are the mill-stones in cast iron or stone, banded with rings of iron and turning in a circular trough with a grated bottom. The calcined stone is fed into the mill, and those parts which are ground down extremely fine pass through its gratings. The rest is removed by a suitable mechanical appliance for grinding.

One of the mills carries a most ingenious arrangement for screening the fine powder. Below the grate there is a strainer in the form of a truncated cone. Of the powder which falls upon this strainer through the base of the annular grate, part passes through the meshes and escapes through the lower part of the apparatus; the rest slides on the conical strainer, falling on a table at the bottom, and is constantly lifted by a chain and replaced on the table of the mill. After the powder is sufficiently ground it is conveyed below into a storehouse where it is placed in bags. The mills are driven by a 12-horse steam engine.

The whole of this establishment is ably arranged and managed, from the quarries to the plaster depot, and the working out of all the practical details does honour to the able proprietor who created them, and who still works daily to improve them.

THE ORNAMENTAL ROCKS OF DEVON AND CORNWALL.*

MR. DAVID PAGE, in one of his most popular geological works, remarks of the primary systems that the vast bulk of their strata "is little fitted for architecture; but their limestones, marbles, and serpentines are often of great beauty, and much sought after for ornamental purposes, while their fine grained cleavable clay slates afford abundant material for roofing and other multifarious appliances." These words almost exactly describe, from an economical point of view, the lithological characteristics of the two counties of Devon and Cornwall.

First we have to deal with the ornamental rocks. In respect to these no district in England is so rich; and it may be added, even at the present day, so undeveloped. Devon supplies an almost infinite variety of marbles; Cornwall an equally varied store of granites and porphyries, and a rock that surpasses all others in beauty—the serpentine.

Devonshire abounds in beds of limestone, most of which are sufficiently hard to receive a good polish and are in effect marbles. We find them among the carboniferous strata of the north of the county; and they form one of the most important constituents of the Devonian system in the south. It is with the latter that we have chiefly to do, although the former furnish black and gray marbles

* By R. N. Worth, in the *Western Chronicle of Science*.

of fair quality. The limestones of Plymouth, Torquay and Ipplepen are unequalled in the kingdom for their varied character and their beauty.

It seems to have been barely a century since that general attention was directed to the value of these rocks for purely ornamental purposes. They had long been quarried for lime, and for building; but the fact that throughout the mediæval churches of Devon wherever polished marble enrichments were introduced, Purbeck stone was almost universally employed, indicates clearly enough that the builders were unaware that they had in the coralline limestones of Plymouth and Torquay a substance far more beautiful than the shelly marbles of Dorset.

One of the first to call public attention to the value of the Western marbles was the Rev. Mr. Gilpin, who ninety years ago declared, in his "Observations on the Western Parts of England," that he thought the Plymouth marbles more beautiful than any foreign marbles. Not long afterwards, Polwhele, in his "History of Devon," directed special attention to the marble of S. Mary Church (Torquay) as of "superior beauty to any other in Devonshire, being for the most part either of a dove-coloured ground with reddish, purple, and yellow veins, or of a black ground mottled with purplish globules." Within the past fifty years the fame of the Devonshire marbles has spread far and near; and they are now in general request. Some have even been shipped for decorative purposes to Italy.

The principal localities at which they are now worked, are Petit Tor, Torquay; Plymouth, and Ipplepen. The marbles of Torquay and Plymouth closely resemble each other. The prevailing hue is gray, with veins of red, black, white and brown; but of some the bases are red and yellow, whilst others are rendered exceedingly handsome by the markings of the fossil corals of which they are almost wholly composed. These are the madreporæ marbles. At Cattedown, near Plymouth, black marble is extensively worked; and at Kitley, a few miles distant, green and rose-colour varieties exist. The Ipplepen marble has a roseate-dove-colour ground with reddish veins.

The employment of the granitic and porphyritic rocks of Cornwall, ornamentally, is of very recent date. Indeed we may say now, as Sir H. De la Beche said thirty years ago, "that they have hitherto been much neglected." Their variety is almost infinite. There are first the ordinary gray or bluish grayeven-grained granites of the Cheesewring, Par, or Penryn, and the porphyritic grauite of Lamorna Cove, with its large crystals of felspar; each and all of which when polished look exceedingly well. It is, however, to the less widely disseminated porphyries and elvans that we must chiefly look. Among these are to be found every variety of combination and tint which the admixture of black, brown, white, red, gray, and purple, in crystals, grains, and specks can produce. Nowhere are the capabilities of these rocks for decorative purposes better seen than at Place House, Fowey. The Treffry estate is rich in granites and elvans; and the late Mr. Austen Treffry drew largely from their resources for his additions to and decorations of that mansion. Some are white with black specks; others flesh-colour mottled with white or black; others again are a chocolate hue, with gray spots; and some are red and black. Sir H. De la Beche, who refers to a few of these in his "Report on the Geology of Cornwall, Devon, and West Somerset," mentions also a light-brown granite from Castle-an-Dinas, near Penzance; a variety with purplish felspar near Gwennap; one with rose-coloured spar at Cligga Point; and a porphyry with felspar crystals of a greenish hue, in a light flesh-coloured base. He speaks likewise of a white granite found near Okehampton, which resembles statuary marble. It would, however, be impossible here to give any adequate idea of the varied beauties of these classes of rocks as represented in the West. Their extreme hardness, though it causes them to keep their polish, is against their very general use; but certainly more might be done with them than at present, if some practical man were to take up the question of their ornamental utilisation from a business point of view.

Beautiful as are the marbles and the granites, they must yield place to the serpentine of the Lizard. Of this there are two (speaking in an ornamental sense) distinct varieties—the green and the red. The latter appears to be the most popular; but the former is incomparably the most beautiful, particularly in those cases where the olive green base is traversed by red veins. Yet there are some purposes—such as chimney-pieces—for which the deep, warm tone of the mottled red kind renders it preferable. The principal characteristic of the Lizard serpentine is the richness and "body" of its colouring. One seems to see beneath the surface. We have classed

the serpentine, roughly, as green and red; but for those who are not acquainted with this most beautiful stone, it should be added that the varieties of tint are almost endless. Associated with the serpentine is the diallage rock (small crystals of diallage are disseminated through a good deal of the serpentine) or Crousa Down stone, the principal tints of which are purple and green.

Among matters of minor importance may be mentioned the steatite veins in the serpentine, some of which are large enough to be used for ornamental work; the flints and chalcedonies associated with the chalk and greensand in the east of Devon; and a variety of red jasper occurring in large blocks on the north of Brent Tor, Tavistock. Spar, of which the varieties in Cornwall and Devon are almost endless, and some of which are as good as the famous Derbyshire spar, has never been taken in hand, and its capabilities are quite undeveloped, yet it might be used with great advantage and effect in the more delicate kinds of interior decorative work. Rock crystals have occasionally been employed for these purposes, but (in former days) more frequently for jewellery, under the name of Cornish diamonds.

EXCURSION OF THE WORCESTER ARCHITECTURAL SOCIETY.

A PARTY of the members and friends of this society enjoyed their annual excursion on Wednesday, the 5th inst. We are indebted to the *Worcester Herald* for the following account of it. After taking train to Evesham, the party numbering forty, bowled away to Child's Wickham which possesses an interesting Norman church, but which was neglected until fears were entertained that its roof would come down and the walls give way; thanks however to the energy of the vicar, Rev. J. Hartley, the work of restoration was commenced and is, now nearly completed. The nave has been almost rebuilt and new roofed, new seated and floored, new entrance doors, and tower repaired. It is, however, to be regretted that owing to the non-employment of a competent ecclesiastical architect, there has not been a better conservation of the old Norman work of the nave, and that the renovation, in the Perpendicular style, is poor and monotonous. The chancel, too, which requires loving and careful handling, has been untouched; this part of the work devolves upon the lay impropiator—Sir Thomas Phillips. It is a church of good pretensions, and has a fine tower and spire. Some old stained glass was shown, as also a photograph of a mural painting discovered during the restoration. The latter illustrates the legend of the gigantic S. Christopher carrying the infant Jesus across the river. The village of Child's Wickham is peculiar and curious, with its houses some of stone and others timber-framed, gabled, or turreted. Some houses are thatched and have actually wooden chimneys! The base and shaft of the old village cross was covered with "native infantry," staring wildly, wondering prodigiously, awe-stricken even to self-denial of the undevoured bread and butter which was in most of their tiny hands.

Of all the places visited on the above day, the next—Buckland—was by far the most attractive. It is situate in a most romantic spot of undulating ground, with woods and charming glens; and the village, the ancient houses therein, the church and its contents, are gems. The rector, Rev. W. Phillips, courteously received the visitors, and showed them whatsoever was deserving of notice. The rectory is between three and four centuries old, in the hall of which is a lofty hammer-beam timber roof; and one of the windows contains old stained glass, with shields, the words "In nomine Jesu" frequently repeated in scrolls, a number of birds, and the rebus of Grafton, the then rector, namely, a graft above a tun (Graft-tun), and one of the shields carries the arms of Gloucester Abbey. There are very thick oak lower shutters to these windows, and in this case the upper chamber abuts upon the hall instead of the minstrel's gallery. The rector also showed an embroidered altar-cloth, made out of an old cope or copes of the fifteenth century, also a mazer or drinking bowl, of maple, painted, having a silver rim on which is the following inscription:—"Magister Wingfield, rector de Buckland, huc poculo addidit aliquid ornatus. Willicmus Longmore me fecit, An. Dom. 1607." In the bottom of the bowl, interior, is set a figure in a kind of medallion, supposed to represent S. Margaret, standing on a dragon. In the village is another remarkable old house, of the fourteenth or fifteenth century, said to have been a manor-house of the abbots of Gloucester. But the church is the great feature of the place. It is chiefly of the thirteenth century, and has a chancel, nave, and aisles divided

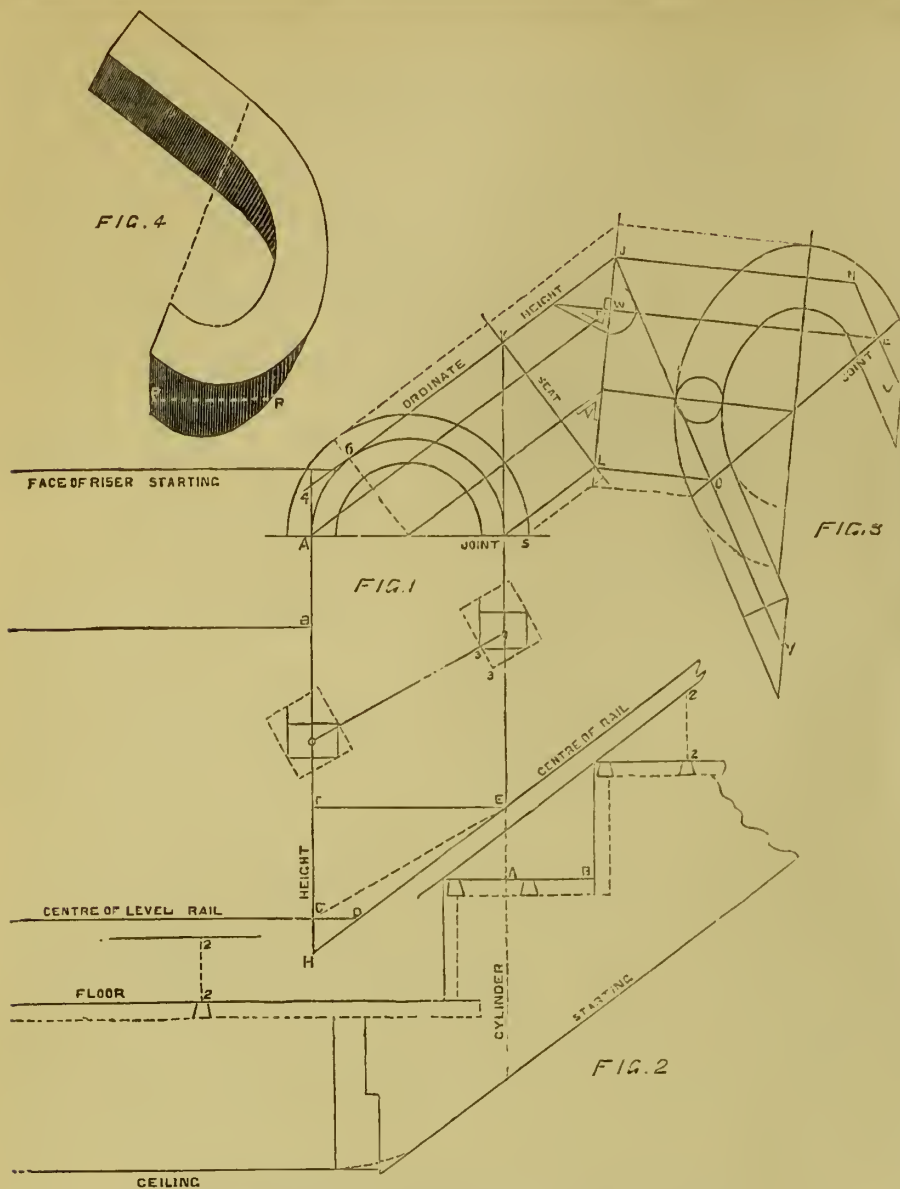
from it on each side by three pointed arches, a rich open roof, a square tower of oolitic stone, from the angle of which issue very demonstrative gargoyles, like evil spirits driven out of the sanctuary. Here are a sanctus-bell cot, a holy-water-stoup, fifteenth century seats, stairs to rood-loft, and encaustic tiles of special interest, but which we have not space to describe here. The curious timbers of the roof exhibit a remarkably good example of the tie-beam, and bear in their richly-pierced spandrels the white rose of Edward IV. painted, and there are Elizabethan canopies over great family seats against the south wall of the nave aisle. This is a very rare feature indicating an occupation intermediate between a chantry and a high inclosed family pew. Of the latter there are some specimens here more than 6ft. high, one of them having a spring lock on the door! Against the wall of the north aisle of the nave is an old bench with wainscoted back on which is this inscription: "Thomas Izard and Jas. Sawthorn of thair own charg have given this wainscoat and beuchin to church in the yere of our Lord, 1615." The east window is of Elizabethan date, the three upper lights having stained glass representing baptism, matrimony, and extreme unction.

With great reluctance the visitors got away from this place (which ought to find a local historian), and drove to Broadway, dining at the Lygon Arms there at two o'clock.

The village of Broadway is of itself a sufficient attraction for an antiquary, with its broad and handsome street, fine mansion-like stone buildings, mullioned windows, gables, picturesque chimneys, and other indications of former importance; and the Lygon Arms has the date 1620 carved on its stone doorway. Rev. C. S. Caffin chaperoned the party, who, after visiting the commodious new school, peeped into some labourers' cottages which once combined to form a manor-house of the abbots of Pershore. The roof of the hall, the windows and timber roof of the supposed chapel, yet remain. Next we went to the new church, a building erected in 1839-40 by the late Mr. Eginton, of Worcester, on the site of an old chapel; it is in the Early English style, and very good for the period in which it was built. Thence to the old church (S. Eadburgh's) at some distance from the village. This building was for many years in a ruinous condition and unused, having been gradually deserted by the parishioners after the making of the new road to London, which took away the bulk of the population from the immediate neighbourhood of the old church. It is now in good repair, but is only used as a mortuary chapel. It is a cruciform building, with a central tower; has Norman pillars in the nave, but the rest of the work is chiefly transitional from Decorated to Perpendicular; portions of the rood-screen and door remain, and there is a mural brass to Anthony Dalton, 1572, also the arms of Charles I. (1641) are preserved, which is somewhat unusual, owing to the general removal of the royal arms during the Commonwealth. The altar table is of wood, and the font is circular and entirely plain. An old wooden pulpit, semicircular, and apparently of the date of the fifteenth century, has on its rim the inscription, "Where the Word of God is not preached the people perish," Prov. xxix. This may have been put on at a later period. The old gravestones and inscriptions in the churchyard are highly suggestive, some of them reminding us of honest old Fuller's observation: "On some monuments the red veins of the marble seem to blush at the falsehoods written on it. He was a witty man that first taught a stone to speak, but he was a wicked man that taught it first to lie." One little stone has the unusually early date of 1516.

The party next went to Willersey, where the church is being restored, and is now resplendent with encaustic tiles, handsome reredos, sculpture, and decoration. It is a cruciform church, with tower at intersection, and groined roof beneath. A gallery, belfry, and altar-piece, have been removed, and the change from what we knew it to be a quarter of a century ago is so great that we could by no means recognise the building. The newseating is admirable, enriched with carving and judicious colouring; and—what is still better—there is no difference between the treatment of the seats for rich or poor. Rev. W. B. Gale, the rector, showed us the communion plate, date 1682, and a fine linen cloth, made by hand in 1664, and now in excellent condition.

Saintbury was the last place visited, and here the Rev. W. Barrett kindly received the party. This church is also cruciform, and among its notabilia are a Norman doorway; a brass, dated 1574; the remains of steps leading to the rood-loft; a double piscina, with one basin gone, and stone shelf; graduated sedilia, without canopies; and a pretty peal of bells.



NEW ELEMENTS OF HAND-RAILING.—PLATE XXXVIII.

NEW ELEMENTS OF HAND-RAILING.*

(Continued from page 26.)

PLATE 38.—CONSTRUCTION OF A WREATH IN THE SOLID STARTING FROM THE LEVEL FLOOR.

TO produce, on a pure principle of construction, a wreath without a joint, is a problem in practical geometry the most beautiful that has been applied to the science of HAND-RAILING; and is a subject of such value and importance as to induce me to show it in a still different position to that given in preceding plate.

There is no limit to the size of the cylinder; the only point to be fixed being the location of the riser starting, and even this is determined with great nicety.

Here the additional thickness of plank is on the upper surface, and the slab cut off of the lower.

Fig. 1 shows the ground plan, the centre line of rail being given, and half its width set off on each side. Let the tangents SK and GK equal diameter from centre to centre of rail. Extend GK both ways, cutting at 4.

We must now find the position of riser starting. Also height of wreath by making the elevations of a square step and the floor as shown at Fig. 2.

Let underside of rail rest on corners of step. Have the underside of level rail above floor to suit long baluster 2·2 on square step. Set off half thickness of both rack and level; which intersect at D. Let DC equal A 4 on plan. Next, draw a line through C, cutting the rake at H. Then set off from C the diameter, as shown by dotted line on the right, cutting at E. Next, square over EF, which gives FH for height, and AB for position of riser. Transfer this to plan, and draw riser B. Then set off a step and draw face of riser starting.

Next, make the seat square with ordinate GK. Let KJ, the height, equal that of HF. Join JL. Square over the lines. Let LO equal L and centre of joint. Join JO extended. This line, to be correct, must equal EH, Fig. 2. Let JN equal K 4. Then draw from N, cutting at E, and parallel with JO. Join OE. The line NE, to be correct, must equal DH on the elevation. Again, OE must equal EC.

These lines being proved correct, proceed and draw the major axis, as shown.

Now find points, and strike the curves. Let VV on the mould be parallel with JL. Have the stuff cut square through. Joint the edges VV square with surface of plank. This done, square over VV across the edge. But, before proceeding any farther, notice square section at Fig. 1, where it is seen that the additional thickness of stuff required for this wreath is on the upper surface. The line OO being parallel with EC. Then we have 3·3, which transfer to square line on edge of stuff VV, measuring from lower surface.

This gives points to apply bevel V.

The lines which it makes on the edge direct the application of mould to both sides of stuff.

The slabs being cut off, and the wreath having its cylinder form, you are ready to make the joint through E, and that on shank. But, if preferred, the joint on shank may be made at once in the usual way, as bevel T produces the same result on shank as that of V.

This may seem strange when the angles are so entirely different. It is owing to the manner in which the bevels are applied. The stock of V stands parallel with pitch JL, whilst that of T stands square with line OV.

Fig. 4 shows the wreath worked to its cylinder form. The slab PR is cut off the lower side and square with the joint.

METROPOLITAN BUILDINGS AND MANAGEMENT BILL.

AT a meeting of timber-merchants, saw-mill owners, cabinet-makers, wheelwrights, pianoforte-makers, packing-case makers, coopers, and others, held at Messrs. Wornum's Concert Hall, Store-street, on Tuesday, the 18th of July, 1871, which was presided over by Mr. Howard—it was resolved unanimously—"That, in the opinion of this meeting, the passing of the bill now before the House of Commons, entitled 'The Metropolitan Buildings and Management Bill,' would most injuriously affect the interests of timber merchants, saw-mill owners, cabinet-makers, wheelwrights, pianoforte-makers, packing-case makers, coopers, and others, who are engaged or interested in the wood trade, or are owners and occupiers of large and spacious buildings. 2. That the passing of the bill would entail the necessity of such alterations in the buildings, yards, and premises of persons engaged in the above-mentioned trades and manufactures, and in the conducting thereof, as would seriously cripple and interfere with the same, and result in many cases in the complete suspension of such trades and manufactures, and the diversion of them from the metropolis, and probably into foreign channels. 3. That if the said bill should pass, the above-mentioned trades and manufactures would be so affected as to throw many thousand artisans out of employ. 4. That, a petition be presented to Parliament against the bill, and that Alderman Lawrence, M.P., be requested to present it, and oppose the bill. 5. That the thanks of this meeting be given to Messrs. Wornum for the use of their room, and to Messrs. Trollope for the use of their office for the meetings of the committee."

ARCHÆOLOGICAL.

BORDER TUMULI.—Mr. John S. Phene writes concerning his recent explorations on the Marquis of Lothian's estates as follows:—I believe the following very satisfactory result of some investigations I am making at Mount Teviot, and on the Marquis of Lothian's Border estates generally, will interest many who will shortly be travelling northwards to attend the meeting of the British Association at Edinburgh. His lordship's head forester and a staff of assistants being authorised to carry out my suggestions, I made a careful survey of the estates around Mount Teviot, and finally selected those of Timpendean for my exploration on this occasion. The result has proved even more fruitful than my former examination of his lordship's more distant property. On Timpendean "Muir," and in the surrounding woods, are several oval British camps, while in one of Roman construction has been built the Border tower of Timpendean. On the "muir," are several small tumuli, and it is also crossed by a Roman road—a tributary to "Watling-street." Several of these tumuli were opened without result, one only exhibiting remarkable features. Composed of large boulders and earth to a depth of 18in., on being cut through it showed a uniform layer of thick unctuous earth mixed with charred wood; beneath this is a very regular stratum of clean white sandy soil, with a few quartz pebbles, and a chipped quartz like an arrow point; beneath this a stratum of about nine inches of foreign soil, and then the original level of the surrounding land. Finding these results rather barren, I abandoned the tumuli and re-surveyed the "muir" for other indications. A few stones cropped out in an apparent circle; others were found hidden by vegetation, which, when exposed, gave a slightly oval form. I ordered a cutting to be made across this, and on removing the turf the space was found to be regularly paved with moderately-sized boulder stones, in a single layer; beneath these the maiden soil was undisturbed. But on a close examination discoloration was found at uniform distances within the outer circle or oval of stones, and at spots where the pavement was deficient; at a few inches' depth charred wood was found, which descended vertically and terminated in each case in black decayed wood, almost reduced to the consistency of earth where the wood was charred; it had preserved its texture so completely that the grain of oak was distinctly visible. In excavating at one of these spots, a small circular stone amulet, carefully holed through the centre, was obtained, and adjoining the one nearest to the Roman road a fine urn, inverted, full of calcined bones and vegetable charcoal, and near it some white quartz pebbles. The urn is finely marked with British incisions, and about 10in. in height. The extant examples of this kind of British dwelling are very rare, the nearest, if not the only ones being those by Loch Etive, in Argyleshire, where the remains of the wooden stakes which supported the conical thatched roofs mentioned by

* This series of articles is a reproduction of ROBERT RIDDELL's work on the subject, published in Philadelphia, and by Trübner and Co., London.

Strabo were also capable of identification. It appears to me that the dwelling, having been burnt, the charred stumps of the wooden supports remained in the ground, and the burying of the urn of the slain chief was probably beneath the spot where he fell or expired on the domestic hearth, on the side nearest the Roman road, from which quarter the attack no doubt would have come.

PARLIAMENTARY NOTES.

NORTH METROPOLITAN TRAMWAYS BILL.—On the order for the third reading of this bill on Thursday week, Lord Egerton of Tatton suggested that the consideration of the bill should be postponed for a few days. The whole question of metropolitan tramways was under discussion in another place, and he thought it would be wiser to postpone this bill until the subject had been considered as to whether bills of this nature should be proceeded with, and, if so, under what conditions.—Lord Redesdale also thought it would be better to postpone the bill, and the third reading was, therefore, postponed.

INHABITED HOUSE DUTY.—In reply to Mr. Mundella, the Chancellor of the Exchequer said he did not propose to relieve bankers, merchants, traders, and professional men who left their business premises in the care of a watchman and his family from the charge of inhabited house duty. The duty was levied on persons well able to pay, and, as he wanted the money, it was easier to collect in this shape than it might be in another.

THE THAMES EMBANKMENT.—Mr. Watkin Williams asked the First Commissioner of Works who was responsible for the paving of the Thames Embankment roadway adjoining S. Thomas's Hospital with granite blocks; whether such paving, by increasing the noise of the traffic, was not calculated to affect injuriously the patients in the hospital; and whether he proposed to take any steps to prevent such injury to the hospital.—Mr. Ayrton said the pavement of the roadway near S. Thomas's Hospital had been laid down by the Metropolitan Board of Works at the request of the local authority of Lambeth, after consultation with the architect of the hospital, who made no objection, and by the local authority alone it could be altered.

LEGAL INTELLIGENCE.

TRADE UNIONS IN MASSACHUSETTS.—The Supreme Court of Boston, U.S., has given a decision in the case of John Carew v. Alexander Rutherford and others, a suit to recover back money paid the defendants, who are members of the Journeymen Freestone Cutters' Association of Boston and vicinity. It appeared that the plaintiff, who is a freestone cutter, of South Boston, and not a member of the Association, had made contracts to furnish cut freestone for various buildings, among others the Roman Catholic Cathedral. By a vote of the Association, a penalty of 500 dols. was imposed upon the plaintiff because he had sent some of his freestone to New York to be cut, contrary to the rules of the Association. The plaintiff refused to pay this sum, but subsequently paid it, it being otherwise impossible for him to perform his contract. He now sued to recover this sum back and damages for injury sustained by him by reason of the acts of the defendants. At the trial in the Supreme Court, the judge ruled that the plaintiff could not maintain the action, and judgment was entered for the defendants. The plaintiff alleged exceptions, which have been sustained by the Supreme Court. The rescript is as follows:—"A conspiracy against a mechanic who is under the necessity of employing workmen in order to carry on his business, to obtain a sum of money from him which he is under no legal liability to pay, by inducing his workmen to leave him, and by deterring others from entering into his employment by threats or otherwise, so that he is induced to pay the money demanded under a reasonable apprehension that he cannot carry on his business without yielding to the illegal demand, is an illegal conspiracy, and the acts done under it are illegal, and the money thus obtained may be recovered back; and if the parties succeed in injuring his business, they are liable to pay all the damage they have done him."

TESTIMONIAL TO AN ARCHEOLOGIST.—We understand that a movement is on foot—more particularly within the town of Rugby—to present Mr. Matthew Holbeach Bloxam with a testimonial, on his retirement from the office of Magistrates' Clerk, which he has held for many years in the Rugby division. Amongst living archaeologists Mr. Bloxam holds a deservedly high place. He has devoted a large portion of the leisure of his busy life towards the elucidation of his county's history. His works on architecture are well known; indeed, they have run through editions almost numberless. They have been translated into foreign languages, and form, with Rickman's celebrated work, the best books of ancient Gothic architecture.

Building Intelligence.

CHURCHES AND CHAPELS.

EXETER.—The parish church of S. Martin is now undergoing restoration, as regards its interior decoration, at the hands of Mr. Samuel Hutchison, of Broadgate. The work was commenced on Tuesday week, and almost the first attempt of the restorer brought to light subjects of interest. The portion of the fabric first dealt with was the chancel arch, a fine specimen of twelfth century work. On removing the plaster from the face of the north side, a niche about four feet high, by eighteen inches wide, was discovered, filled up with rubble. This was probably the repository of the patron saint of the church. On removing the plastering from around the niche, several sections of carved freestone, highly-coloured, were found, which no doubt formed part of the canopy and base of the niche. On the south side of the arch portions of texts in old English black lettering on a stone ground, finishing at the base with a redcross diaper on a buff ground, were discovered, but unfortunately much defaced. Some of the words are distinct, and, as the work proceeds, it is possible that something may be found to aid in their deciphering.

GAINSBORO'.—Gainsboro' Trinity Church, after being closed for alterations, was reopened on the 6th inst. The chief alterations are a new oak screen and pulpit, and the lengthening of the chancel four or five feet into the nave, to give more room for the choir. The work of both screen and pulpit is of the character of that which prevailed in this country in the early part and middle of the thirteenth century. The designs were prepared by J. L. Pearson, Esq., London; the pulpit was executed by Mr. Robinson, of London; and the screen by Mr. Cant, of Gainsboro'.

INCORPORATED SOCIETY FOR PROMOTING THE ENLARGEMENT, BUILDING, AND REPAIRING OF CHURCHES AND CHAPELS.—This society held its last meeting for the present session (to be resumed in November) on Monday, at the society's house, 7, Whitehall, S.W.; the Earl of Romney in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at South Acton, All Saints, Middlesex; Birmingham, S. Saviour, in the parish of S. Matthias; Lintz Green in the parish of Tanfield, Durham; Homerton, S. Luke, and Kilburn, S. Augustine, Middlesex; Lower Moor, in the parish of S. James, Oldham; Middlesbrough, S. Peter, in the parish of S. John; Plumstead, All Saints, Kent; and Silksworth, S. Matthew, near Sunderland; rebuilding the churches at Hullavington, near Chippenham; Chawton, near Alton, Hants; and Gwernafeld, near Mold, Flint. Enlarging, or otherwise increasing the accommodation in the churches at Dresden, near Stoke-on-Trent; Eynsford, near Dartford, Kent; Hardwicke, near Aylesbury; Henllis, near Newport, Monmouth; King's Pyon, near Weobly, Hereford; Midhavant, near Chichester; Norton, near Faversham; Nun Monkton, near York; Radford, near Coventry; Reading, S. Giles; Stoke Fleming, near Dartmouth, Devon; Uxbridge, Middlesex; and West Bridgeford, near Nottingham. Under urgent circumstances, the grants formerly made towards reseating and restoring the churches at Llanstephen, near Llysven, Radnor; Watford, Herts; and South Shields, S. Hilda, were each increased. Grants were also made from the School Church, and Mission-house Fund, towards building school or mission churches at Cross Inn, in the parish of Llanllwchaearn, Cardigan; Hedworth in the parish of Jarrow, Durham; and Leigh, near Marchester.

LLANYCHAER CHURCH.—The ancient church of this parish has fallen into such a state of decay as to make it impossible for the most enthusiastic architect to retain it at all in its present state; it is therefore proposed to take it down entirely, and to erect a new building, following the same plan, with the addition only of a vestry. The character of the church will be as much as possible after the type of the South Wales churches of the immediate neighbourhood. The bell gable, for instance, is similar to that of the adjoining parish of Castlebigh. The walls will be built of great thickness of the mountain limestone, the dressings are to be of Forest of Dean stone, in preference to Bath, which has failed in one or two modern churches of the neighbourhood. The roofs will be of Baltic fir, formed after the fashion of the old roofs of the fourteenth century, in large scautlings. The windows are to be glazed with two tints of cathedral glass. It may be perhaps superfluous to add that in taking down the present building the greatest possible care will be taken of any ancient fragment of old work. Mr. Edwin

Dolby, of Abingdon, has been entrusted with the work as architect.

LUDDENDEN FOOT.—Last week the Venerable Archdeacon Musgrave, D.D., laid the corner-stone of a new church at the village of Luddenden Foot, near Halifax. The new building is to be from designs by Messrs. Parr and Strong, of London. It will be in the Early Decorated style, having a tower and spire rising to a height of 117 feet, and will afford accommodation for over 500 worshippers.

STEPNEY.—A church, with a lofty tower eupola in front, was consecrated on Tuesday by the Bishop of London. It is situated in the ancient hamlet of Ratcliff, part of the old parish of Stepney, on the north side of the Commercial-road, and nearly opposite the Stepney station on the Great Eastern Railway. The cost is upwards of £5,000. Messrs. Dove Bros., builders, and Messrs. Newman & Billing, the architects. The church is dedicated to S. Matthew.

WHITEHILL.—On Monday week the foundation stone of a new Wesleyan chapel was laid at Whitehill, Staffordshire. The building, which is to be erected from the design of Mr. George B. Ford, architect, Burslem, by Mr. James Wood, of Willaston, will be a neat structure, faced with red bricks, relieved by bands and vousoirs of blue bricks. Its dimensions, externally, will be 32ft. 8in. by 29ft. 8in. and it will provide accommodation for about 120 persons. The cost will be £350.

BUILDINGS.

HOWDEN.—The foundation-stone of the New Market Hall at Howden was laid on Monday afternoon. The new building is to be constructed of brick, with stone facings, in the Tudor style of architecture. The front to the market-place will present a lofty embattled gable, with two-light windows, which will light the large public room erected over the market. Between the windows, in a canopied niche, is to be a figure of Roger de Hoveden, the early English historian, who was a native of Howden. Below, two well-proportioned arches open into the Market Hall, and at the side are a turret and two well-arranged sale shops. The Market Hall is to be spacious and commodious, and the public room will be approached by a wide and strong staircase. It will be well lighted, with an open timbered roof, and will have a stage or platform at one end with convenient retiring and committee-rooms. The architects who have furnished the plans are Messrs. M. E. Hadfield & Sons, of Sheffield, and the works are being carried out by Messrs. Sinclair & Sons, builders, Howden.

THE NEW HOSPITAL AT WEST BROMWICH.—This building is now completed. The buildings are arranged in three groups. The out-patient department is in the centre, and the administrative immediately behind it; and the general offices, kitchens, larders, and scullery are placed at the rear of this block, being separated from the main building by a corridor. The whole of the buildings are built of brick, with stone heads and sills to the windows. Every portion has been kept studiously plain, and the only part that makes any pretence to ornamental treatment is the entrance doorway. The buildings have been erected by Messrs. Trow, of Wednesbury, from the designs and under the superintendence of Messrs. Martin & Chamberlain, Birmingham. The cost is between £5,000 and £6,000.

WORKSOP.—Mr. George Mayor is about to erect a large and commodious building in Bridge-street, to be used as an auction-room, with space for a working-man's club, gymnasium, subscription billiard-room, &c., involving an outlay of £3,000.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—The annual meeting of the members of this society was held on Friday last at their room, 4, Westminster-chambers, when the report of the council was considered. It congratulated the members on the satisfactory condition of the society and the merits of the papers read during the session. Votes of thanks were then passed to the outgoing President, Mr. James B. Walton, A.I.C.E.; the Treasurer, Mr. Arthur C. Pain; and the Secretary, Mr. Charles H. Rew. The following were then elected office-bearers for the ensuing year:—President, Mr. Arthur C. Pain, A.I.C.E.; Vice-Presidents, Messrs. G. J. Crosbie Dawson, A.I.C.E., and Charles W. Whitaker; Members of the Council: Messrs. R. M. Bancroft, F. E. Cooper, Wm. Meakin, F. Lee, A. Tyrell, A. Walmisley, and G. W. Wilcocks; Hon. Treasurer, Mr. Charles H. Rew; Hon. Secretary, Mr. H. E. Hunt. Mr. J. Wagstaff Blundell was re-elected Hon. Accountant. The meeting was adjourned until the opening of the next session on the first Friday in December.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

THE "BUILDING NEWS Sketch Book" has been sent to all the contributors to it whose addresses we have. The other contributors who have not received it will please communicate with the office.

RECEIVED.—R. P. S., T. G., C. B. A., J. C. J., J. P. S., E. W. G., C. L. E., G. & Co., T. H., J. & W., J. C., C. E. D. S. S.—One shilling. Your reply next week.

S. F. PILLS.—Photo to hand.

S. DOLBY.—Photo and plan received.

JAS. HICKS.—The drawing to hand.

ANIS.—Your query as to the name and address of a brick manufacturer involves a gratuitous advertisement.

J. E. K. CUTTS.—Photo and sketches to hand.

Correspondence.

THE AMERICAN OVO ORDER OF ARCHITECTURE.

To the Editor of the BUILDING NEWS.

SIR,—Everywhere among architects, of no matter what country they are situated in, there is a cry for a new style of architecture. The era of copyism is over. Not, alas, from any worthy motive, but simply because there are no other good styles to copy. The unproductiveness of the recent Gothic revival, and the immense waste of mind and money caused in furthering a style which everybody now agrees is unsuited for the time, and unworthy of our knowledge, has, however, resulted in making architects fully alive to the mistake which has been committed by them for so long, and shown that they are now making a decided effort to work out something distinctive, which cannot be branded with the stigma of copyism.

Meantime, while Europeans have been expending any amount of talk on the subject, advocating the adoption of Early English, Romanesque, Venetian, Gothic, Moorish, or something else, as a starting point, and yet never advancing any further, we have here an American, with the characteristic go-ahead confidence and self-conceit of the nation, not advising the adoption of any style as a commencement, but claiming to have *invented* an order of architecture himself, superior to anything ever *invented* by the Grecians, Romans, and Mediaevalists. The inventor of this wonderful order, which is to spring into being by the efforts of one man (in entire opposition to the opinion of everybody who has written on the subject, declaring that one man could not do it), is Isaac Hobbs, architect, Philadelphia. Hear what he says:—

"We have invented a new order of architecture. The American Ovo order of architecture for church buildings and large public edifices. It is far superior to the most elaborate styles of the highest type of flowered Gothic or Mediaeval architecture. We will give a design of a house in a few months that will illustrate this order. Its characteristics are elegance, perfect perspective adaptation, an order of constant change and variety, of which every little detail is fixed by the laws of perspective and mathematics. The whole preserves a unity and grandeur unsurpassed by no other order or style invented by the ancients."

The opinion of every reader must be that the foregoing is a unique specimen of Americanism; and while perusing it, we don't know what to wonder at most, the audacity, the ignorance, or the self-conceit of the man.

First, he claims to have invented a new order of architecture. This would seem to be no more than the Frenchman did who invented a new French order, by placing a crowing cock in the capitals of his pillars; but we learn further on that he means nothing more nor less than a new style. The order is very complete, too, for the name has been given it—the American Ovo. For what reason it has been called so, and its affinity to the new style, we have yet to learn, waiting patiently for an explanation in the coming illustration. We think it is a great mistake, however, that something more euphonious was not invented, for Americans believe greatly in high-sounding names. They don't like streets so well as avenues, and they have not such buildings as masonic and music halls, only *Masonic Temples* and

Academies of Music. In a theatre also they have not such mean places as pits and galleries, only *parquets* and *family circles*.

In the next sentence we should think we were reading a puffing advertisement for a sewing machine or a patent corkscrew. "It is far superior to the most elaborate styles of the highest type of flowered Gothic or Mediaeval architecture." We suppose that he means that all Mediaeval architecture is flowered Gothic, a statement which a six months' apprentice could contradict. Of this one type also there are a great many styles, and his Ovo order is superior to the most elaborate! According to this statement a style is lower than an order, while a type is higher still, and even that is inferior to a something which he does not state. This is entirely contrary to our preconceived notions of the relative position of these titles, and shows such wretched ignorance that it is hard to believe any architect ever could have written it.

The characteristics of the style are something sublime, and stamp the inventor as a man of genius. "Perfect perspective adaptation" is something which awes the mind, and indicates a grandeur difficult to conceive of, but it is overwhelmed by the finish: "Every little detail is fixed by the laws of perspective and mathematics." Who can understand such conscientious labours, or comprehend the time and study required to work out such an elaborate system of art? The labours of Euclid and Archimedes must have been nothing to them. We have heard of a half architect in Edinburgh who designs all his buildings, and fixes their sizes by geometry and multiples of two and three, but here is a worthy brother who distances him completely. Fancy anyone drawing an architrave by the laws of perspective, and fixing it by those of mathematics. The Americans are very ignorant of architecture, but they must be very ignorant indeed if they swallow all this. Yet it was only the other day we read in a Halifax newspaper a description of a church, which was stated to be designed in the "Composite Order of architecture, being a mixture of the Gothic and Corinthian styles!"

The climax of absurdity and conceit is, however, reached in the last sentence, when he says that the American Ovo "is unsurpassed by no other order or style invented by the ancients." Verily this man ought to receive the gold medal of the R.I.B.A., for Sir Christopher himself never attained or aspired to as much.

The announcement of this wonderful invention appeared in the May number of *Godey's Lady's Book*. We watched eagerly for the June issue of the magazine, but found only an illustration of a house, which was declared with the egotism and self-laudation characteristic of the firm to be one of the best in the Republic.

As Isaac was one of the founders of Israel, and Thomas Hobbes the father of a new school of philosophy, this coincidence would seem to augur well for an invention patented by Isaac Hobbs; yet while we would advise every one interested in a new style to look out for the coming specimen of the Ovo, we are afraid that their hopes of anything satisfactory will be disappointed. It may suit people uncultivated by art like the Philadelphians, whose picture galleries are crowded with scenes of murder, death, and war, but we doubt whether it will ever even reach New York. We noticed while in Philadelphia, also, that there seemed to be a hankering after something new in all the recent buildings. The pointed arch seemed to be given up and the semi-circular adopted in its stead; but the details were so absurd, displaying such lamentable ignorance of the mere alphabet of the art that we may be assured Philadelphians will never carry off the palm from the world in founding a new school of architecture.

Feeling desirous of knowing more about such a wonderful man, we searched the back numbers of *Godey*, and found out enough to give us a curious insight of the working of architecture in America. In the March number is a description of an Elizabethan villa, which adorns the top of the page, where he says, "It is suitable for a suburban residence. Built of bricks and pointed or rubble stone, it would present a grand effect. The cost would be about 17,000 dols. Good proportion is absolutely required for this style of building, and any change in the form of our drawings would seriously detract from its beauty. Owners of property should never permit these alterations without consulting the architect who furnished the plan. Our designs are made in perspective, and we adjust all parts by positive ratios. Our price is 2½ per cent. for full drawings, specifications, and bills of quantities." We should have thought such a great man, inventor of a new style, would never condescend to design in any other, but he does so, and that very badly; for,

following the absurd system which has been in vogue in Britain so long, the American architects are trained to design in every style that ever existed, the consequence being that they can't design in any one style perfectly. The system of designing he adopts is entirely original and worthy the inventor of a new style. "Our designs are made in perspective." We have heard of architects who drew their elevations first, and then made their plans to suit, but here both elevations and plans are made to suit a perspective. We should be much inclined to say that the statement is incorrect on the face of it, for more time would thereby be consumed than would suffice for half a dozen designs. Furnishing full designs, too, for 2½ per cent.! Why, it is ruination to the profession, and he ought to be publicly dealt with by the Institute!

In the February number he has something very choice in egotism:—"All our designs are beautiful because they are well proportioned, and not merely the style or order of architecture to which they belong." "We guarantee to please in our designs, which are always made full size." The latter statement is, of course, to be taken metaphorically.

In the January number, however, he tells us what he desires, and the great object he is pursuing, evidently with the intention of making the people suppose him a patriot of the truest stamp:—"We are anxious for the public good to abolish the miserable system of building and designing, both being done by the carpenter, as their principle is to cling to the old and discard the new, and by this means adapt the same ornament to the cottage and mansion, stable or church, and use the same cornice for the towering spire as the low porch of the cottager's home. This is all wrong, and it is about time that the people of our enlightened age had discovered and discarded it." Who could resist this touching appeal to the art sympathies of the people, or refuse to give him a job if we had it? Yet we are afraid that the sum and substance of his whole harangues seems to be, not a patriotic motive, but a selfish one; not one for the good of his country so much as for the good of his pocket, and by pandering to the vulgar American taste, which would like to believe itself able to thrash everything in creation, to raise a sympathy in his ambitious efforts, and form thereby an extensive architectural practice, which would raise him above the necessity of such mean advertising. But if the American people of this enlightened age don't see through his trickery and pretensions, we have no hesitation in saying that the age of enlightenment for them has not yet arrived.—I am, &c.

Halifax, Nova Scotia.

AND. DEWAR.

THE HOUSE CISTERN.

SIR,—The *Globe*, in its remarks as published in the *BUILDING NEWS* last week, is both right and wrong. With regard to the evil effects of the deposit in the cistern, that is the fault of the householder, whose plain duty it is at reasonable periods to have it cleaned out. Well it would be if this was the greatest evil, but the most mischievous matter in the cistern is the waste pipe, communicating as it does directly with the sewers, and, probably, in a vast number of cases, either imperfectly trapped or not trapped at all. Considering how in our flimsy constructions styled houses, the work seen and known, is bad, we may be perfectly sure that what is out of sight—traps, &c.—is, if anything, worse. In thousands of cases it is probable the waste pipe, unsealed, admits the poisonous emanations from the drains, polluting the water in the cistern and the atmosphere of the house. There ought to be a clause in the Building Act, if the present system of intermittent supply is continued, making compulsory the putting of a trap in every cistern, as well as at the discharging end of the waste. This would be easily done by bending the now straight standing waste-pipe to form a siphon trap. The cistern system, however, should be swept away. And as it is useless to hope that the water companies will voluntarily move in the matter, all who take an interest in sanitary improvements should combine to enforce upon the attention of the Legislature, until it takes action, the necessity of *pure water* and a *constant supply*.—I am, &c., M.

ARCHITECTURAL ASSOCIATION.

SIR,—I beg to inclose a syllabus of the excursion proposed to be made this year to Ely and the neighbourhood of Lynn and Wisbeach, under the guidance of Edmund Sharpe, Esq., M.A. Owing to the great success which attended a similar excursion to Lincoln last year it will be quite unnecessary for me to say anything to recommend this to the notice of your readers; but all applications for tickets must

be made at once, in order that suitable accommodation may be provided for the party.—I am, &c.,
JOHN S. QUILTER.

ELY EXCURSION, 1871.

UNDER THE GUIDANCE OF EDMUND SHARPE, ESQ., M.A.

MONDAY, JULY 31st.—ELY.—The members to assemble at the Cathedral, where Mr. Sharpe will commence his lecture at 1 p.m.

TUESDAY, AUGUST 1st.—LYNN.—The party will leave Ely at 10.40 a.m. by train, for Lynn and visit the churches in the neighbourhood of Lynn.

WEDNESDAY, AUGUST 2nd.—LYNN.—An excursion will be made by carriage from Lynn to the churches lying between Lynn and Wisbeach, returning to Lynn.

THURSDAY, AUGUST 3rd.—WISBEACH.—The party will leave Lynn at 8.50 a.m. by train for Wisbeach, visit the churches in the neighbourhood of Wisbeach, and proceed by train to Boston at 2.55 p.m.

FRIDAY, AUGUST 4th.—BOSTON.—The party will leave Boston by train at 8.3 a.m. and visit the churches between Boston and Spalding, returning to Boston by carriage.

SATURDAY, AUGUST 5th.—BOSTON.—The party will leave Boston at 8.3 a.m. by train for Algarkirk, visit the churches in the neighbourhood, and return by carriage to Boston, at 4 p.m. in time for trains to London, the North, and West.

Arrangements have been made for the board, lodging, and carriage of persons joining the excursion, similar to those made last year, but all desiring to take advantage of these arrangements must send in their names either to the honorary secretaries of the Association, or to Edmund Sharpe, Esq., The Higher Greaves, Lancaster.

JOHN S. QUILTER, } Honorary Secretaries.
BOWEN A. PAICE, }

9, Conduit-street, Regent-street, London, W.

THE SCHOOL BOARD FOR LONDON.

SIR,—Observing a statement in your journal of last week in reference to the appointment of architect and surveyor, which is incorrect, I take the opportunity of sending you the facts which I have obtained from the Clerk of the Board, and will thank you to insert them in your next number.

There were 84 candidates, six were selected, and the votes were as under:—

Name.	Votes.
Mr. Wigginton	0
„ Porter	1
„ Quilter	1
„ James	3
„ Morris	5
„ Robson	24

I am, &c., JNO. W. MORRIS, Candidate.

115, Leadenhall-street, and Poplar,
July 14th, 1871.

STEVENINGTON CHURCH, BEDFORDSHIRE.

SIR,—As your correspondent, "Ecclesiologist," has defended himself entirely on theological grounds, of course I cannot discuss them in your journal. I think that the reasons he has given in defence of his former communication are not satisfactory, as he evidently confines himself to the one idea, that the Nonconformist architect, acting conscientiously, cannot be expected to undertake, in a proper spirit, the restoration of "consecrated" and "hallowed" buildings. It is erroneous to say that Nonconformist architects are not expected to care for the preservation of these time-honoured edifices: on the contrary, I beg to say that we respect, admire, and esteem them, and have as great an interest in them as any one.—I am, &c.,
H. W. P.

London, July 17, 1871.

EXPLORATIONS AT EPHESUS.—Some interesting intelligence has reached us, says the *Athenæum*, respecting the excavations at Ephesus, carried on under the direction of Mr. J. T. Wood, with the object of illustrating the site of the Temple of Diana. Two years ago Mr. Wood came on the peribolus wall built by Augustus. This had four inscriptions built into it near an angle, showing that it enclosed the Temple of Diana and the Augustæum. This wall was traced for many hundred feet, and numerous trial holes were sunk in the area defined by it, as being within the sacred precinct. By these means the pavement of the Temple was discovered, together with *frustra* of columns of white marble and two capitals—all of colossal dimensions. More recently the remains of one of the external columns, measuring 6ft. 1in. in diameter, have been found *in situ*. These remains consist of the entire base and a portion of the lowest drum. The base shows signs of having been coloured red. The works are suspended during the hot season, but will be continued in the ensuing autumn; and Mr. Wood has but little doubt that the result will set at rest the long-mooted questions as to whether the Temple was octastyle or decastyle.

Intercommunication.

QUESTIONS.

[2266].—**Cemetery and Monumental Work.**—Would any kind reader inform me, through "Intercommunication," if there are any works on cemetery and monumental work that give designs and details?—L. A.

[2267].—**Blue Stone.**—Could any reader of the *BUILDING NEWS* oblige me by informing me where I can get a quantity of blue stone that will keep its colour?—JAS. GARSIDE.

[2268].—**Clarified Quills.**—Will some one of the readers of this journal supply, through its medium, a recipe for clarifying goose and crow quills?—B. N.

[2269].—**Segment of Circle.**—Required the area of a segment of a circle—length of arc 410 links, height 25 links, rod 8,000 links. Also, please explain how tables of the areas of circular segments are used?—A MELBOURNE SUBSCRIBER.

[2270].—**Sash Pulleys.**—Laxton's "Price Book" says: "Deal-cased frame, oak-sunk sills, wainscot pulley pieces, and beads, astragal and hollow wainscot or Honduras mahogany sashes double hung, brass pulleys, patent lines, and iron weights (the 2½in. sashes to have *axle pulleys*)."
Are not all sash pulleys *axle pulleys*? I do not see how the pulley can work without an axle. Does the above reference mean that the pulleys are to have brass axles in contradistinction to iron axles?—X. M. B.

[2271].—**Head of Water.**—Will some one of experience kindly explain the mode of calculating the "head of water," and also how to ascertain the height required to go so as to give due pressure to supply a reservoir of 2,500 gallons, and reservoir to supply branch pipes, the water being brought in pipes 500 yards long to reservoir across a valley? Simple formula will oblige.—UNDINE.

[2272].—**A Legal Point.**—I want to rebuild my house; the next one is wider; I wish to increase the width of mine, but a staircase-window, which is never opened, is in the end wall of the other house near to the groin. The light of said window would be destroyed if the connection between were carried through. I shall be glad to know what space the law requires between my end wall and the window in question? Also, should the space be parallel or triangular? An answer would greatly oblige.—X.

REPLIES.

[2265].—**Hagioscope.**—(From the Greek), commonly called squirts—is the name given to apertures which are made obliquely through the wall on one or both sides of the chancel arch, supposed to be for the purpose of enabling the worshippers in the aisles to see the elevation of the Host. At Tilbrook, Bedfordshire, there is a "Chantry Piscina," serving also for a hagioscope. Also one at Castle Rising, Norfolk, and at S. Mary's, Guildford, a stoup is thus used. At Stanground, in Huntingdonshire, there is a hagioscope on both sides of the chancel, and also at Alderton Church, Wiltshire.—S. J. NEWMAN.

WATER SUPPLY AND SANITARY MATTERS.

LIVERPOOL.—The Health Committee of Liverpool have at present under consideration a scheme of an important character which opens up some interesting questions in relation to the disposal of domestic and other refuse of the town, and the object of which is to get rid of an embarrassing difficulty. In the ante-water-closet period in Liverpool, it was easy enough to dispose of the refuse, which then had a large commercial value, and was sought after by agriculturists, but since that part of the contents of middens which rendered them valuable has been systematically cast into the sewers, the problem of disposing of the dry materials has become increasingly difficult. Not less than two thousand tons of refuse accumulate every week, and must by some means be got rid of. A few years ago the Council purchased Carr Hall Farm, for the purpose of depositing the refuse there. That investment cost them £9,000, but they are now agitated by the idea of placing upon good agricultural land heaps of ashes and other rubbish, which are simply injurious to it, and the conveyance of which to this and other places of deposit involves a cost of fifteen to eighteen pence a ton. Agriculturists won't have the rubbish at any price, and the town has, therefore, for some time past been sustaining a loss which has become vexatious and perplexing. In this position they have set their wits to work to find out a satisfactory solution, and some of them seem to be pretty confident that they have at length hit upon a scheme novel and satisfactory.

Mr. Henry Currey, the architect of the new S. Thomas's Hospital, has written to state that he never was consulted by the Metropolitan Board of Works "as to the description of pavement to be laid down in the street adjoining the Hospital," as reported to have been stated by Mr. Ayrton in reply to Mr. Watkin Williams's question in the House of Commons.

STATUES, MEMORIALS, &c.

COMPLETION OF S. PAUL'S.—A correspondent suggests that, among the plans for adorning S. Paul's Cathedral, something should be done to recall the memory of the famous men whose bones and monuments perished in the Great Fire. Two in particular ought not to be forgotten—John of Gaunt and Sir Philip Sidney. Both of these were buried under the pavement of Old S. Paul's.

PROPOSED MONUMENT TO SHAKESPEARE.—On Monday afternoon a general meeting of the subscribers to the Shakespeare Memorial Fund was held at the House of the Society of Arts, John-street, Adelphi, under the presidency of Sir W. Tite, M.P. The chairman explained that the object of the meeting was to decide what was to be done with the balance of £285 which stood over from the Tercentenary Shakespearean Festival.—Professor Donaldson said if there were any probability of subscriptions coming in he should be for going on with the work of the committee, so that they might have in London a Shakespeare monument; that a good statue of Shakespeare should be provided. If they could raise £10,000, it might give them some hope of carrying out the object they had in view.—Mr. Gruneisen said, under all the circumstances, he thought the best thing to do would be to hand over the balance to the Dramatic College, at Woking, an institution which supported and kept those who had represented Shakespearean characters. He should be glad to move a resolution to that effect.—The Chevalier Chatelain said he should be pleased to second the resolution.—Mr. W. Hepworth-Dixon did not think the committee had any power to divert the money from the purpose for which it had been raised. The amount subscribed was £2,400, and there was from £800 to £900 outstanding which had never been applied for. If that amount were called in, he believed a very considerable amount of it would be paid up; and they could then have for a sum of £1,200 a very beautiful statue of Shakespeare erected on the Thames Embankment.—Mr. Richard-sou-Gardner said if there was a determination on the part of the committee to carry out the object for which they were appointed, and erect a statue to Shakespeare, he would undertake to get subscriptions to the amount of 200 guineas.—Mr. Cousens said he would also undertake to raise 200 guineas.—Mr. Hepworth-Dixon said that, rather than abandon the object he had in view, he should undertake to raise 100 guineas. After some further discussion, on the motion of Mr. W. Hepworth-Dixon, seconded by Mr. Godwin, the following resolution was carried:—"That it be referred to the executive committee to endeavour to get in the outstanding subscriptions, and to receive further subscriptions, for the purpose of carrying out the original object for which the fund was subscribed; that the executive committee do have power to add to their number, and to appoint any officials whose places may have become, or may become vacant."

Chips.

A new Hofschaulspielhaus of Vienna is to be built under the direction of the architects Herr Semper and Herr Hasenauer. The work will be commenced at the beginning of 1872.

M. Texier, the well-known archaeologist and architectural student, has died in Paris, aged sixty-eight.

Nottingham builders must have faith in their works, for they seem to fancy that a Wesleyan chapel recently built will stand for more than 1,000 years. They have inclosed in the foundation-stone of that edifice some information addressed "To Macaulay's New Zealander, or any other person it may interest, in or about A.D. 2960." Some specimens of lace were also inclosed in the hollow of the stone.

At Ely, on Wednesday, a pastoral staff was presented to the Bishop of Ely. The staff cost upwards of £100. It was designed by Mr. A. Blomfield, and executed by J. Forsyth & Co. The stem is of ebony with silver bands, the knob of silver enriched by precious stones. The crook is of ivory, inclosing the *Agnus Dei* in silver gilt.

The annual general meeting of the London Diocesan Church Building Society will be held at 21, Regent-street, on Monday next.

The *West Briton* says: The boring machine at Dolcoath has ceased to work. Mr. Doering closed his engagement at the end of June. We regret this termination of another attempt to apply mechanical power to aid the miner in deep and hard-ground mines. The machine is said to be worked with success in many of the foreign mines, and we fully expect to see the time when the principle will be successfully employed in Cornwall.

Asiatic cholera, which has for a month past been prevalent in the Russian town of Wilna, is reported to have spread into Poland, where in one town it has proved fatal to thirty-four persons in a few days.

Mr. Ruskin has been lying dangerously ill at Matlock. He was, however, much better on Sunday, and is now quite out of danger.

Our Office Table.

JUSTICE BEFORE GENEROSITY.—There is a balance of £285 standing over from the proceeds of the Shakespeare Tercentenary Festival, and a meeting was held at the Society of Arts on Monday to consider what to do with it. The result is to be found in another column. We should like to know if this balance belongs to the Society which conducted the proceedings at Stratford-on-Avon seven years ago, and if so how many other outstanding claims remain unsatisfied, for if one we have submitted for advertisements some scores of times were settled, the balance would be less by eight shillings and sixpence. There was another undertaking completed some time since amid a great flourish of trumpets and with great honour and glory to the local grocers and cheesemongers concerned—we mean the Belfast Albert Memorial. We take to ourselves the credit of having (quite unwillingly) contributed a sovereign, all but sixpence, to the funds of that undertaking, in the shape of advertisements. It is rather a pity that when so much money is spent in connection with these matters on "the poms and vanities," a few pounds cannot be spared to pay for the advertisements offered in connection therewith.

ROYAL ARCHEOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND.—This learned association holds its annual country congress next week at Cardiff, where preparations for their reception are now being completed. Lord Talbot Malahide, F.S.A., M.R.I.A., is the President for the year. The congress opens on Tuesday, the 25th inst., when the Marquis of Bute, the President of the meeting, will deliver the inaugural address. The archaeologists will afterwards be entertained by the mayor, and in the evening there will be a reception at Cardiff Castle. There will be daily excursions to the archaeological objects in the neighbourhood, and also daily meetings for the reading of papers.

PURCHASES FOR THE BRITISH MUSEUM.—The British Museum has just effected an important purchase of twelve vases found recently at Capua. These are all of them finely preserved examples of a rare and beautiful class, generally assigned to an epoch little lower than that of Alexander, and distinguished by a large size and supreme and subtly varied elegance of form. They are principally amphore and cratres, without figure designs, but with their bodies painted black, and fluted in the manner which indicates an intention of imitating the forms of metal vases. The neck is generally adorned with a wreath of leaf-sprays picked out in gold.

THE COMPLETION OF S. PAUL'S CATHEDRAL.—"G. H. C." writes to the *Times* commenting on the statement made in the letter of the committee for the completion of S. Paul's, to the effect that the fine series of Munich windows in the apse, executed after Professor Schnorr's designs, is being proceeded with. The committee do not consider Munich glass at all a necessity throughout the cathedral, but, as three of the apse windows are already completed in this material, it is requisite that the remaining three should be of the same class. To this "G. H. C." demurs. However beautifully Munich artists may design and paint, they violate a leading canon of art by not treating glass as glass, but more as canvas, the result being that a certain rich opacity of window-blind effect is produced, but at the sacrifice of the jewelled sparkle and mosaic richness so captivating in the old glass, secured by the use of the *minimum* of paint with the *maximum* of treatment through the various tints of the glass itself, which is now to be obtained almost equal in texture and colour to the old glass. Again he observes as regards light—no unimportant consideration in London—Munich glass produces the greater amount of "obscuration, the early treatment the greater amount of light. It is said that the Munich windows in Glasgow Cathedral are fading. It would certainly not do to place the two styles of treatment side by side, as they would destroy each other; but would it not be the wiser course to pursue in so important a matter of internal decoration—second to none other in the Cathedral—to remove the Munich windows already in the apse, rather than increase the difficulty of removing all by and by? Why not pause with the apse, and proceed tentatively with two or three windows elsewhere in the building. It appears to be a pity that the use, in a building of such world-like renown, of a debased treatment of glass, condemned by our best art critics, should appear to be sanctioned and recommended under such an authority.

THE VENDÔME COLUMN.—A search made at the house of M. Camélinat, director of the Mint under

the Commune, has brought to light a very curious calculation on the profit the Commune expected to make out of the Vendôme Column. The expenses of pulling it down were 25,000 francs; those of its transport 15,000 francs. It was calculated that they have to add 75,000 francs' worth of copper to the bronze to convert it into sous. This alloy was to have produced a million of francs, in five or ten centime pieces. The memorandum of M. Camélinat concludes by saying that thus a net profit of 885,000 francs would be obtained.

THE PEABODY GIFT.—On the 1st of next month will be formally opened another block of dwellings, Peabody-square, behind a row of trees at the lower end of the Blackfriars-road. Here are two quadrangles of buildings, relieved by a cluster of trees in the centre of each square. The two quadrangles afford accommodation for 320 tenants, occupying one room at 2s. 6d. a week, two rooms at 4s., or three at 5s., and at these rates the whole building is already taken.

DEATH OF MR. NEWLANDS, THE LIVERPOOL BOROUGH ENGINEER.—On Friday night, Mr. James Newlands, for upwards of twenty five years the engineer and surveyor of the Liverpool Corporation, died in that town. Mr. Newlands only retired from the active duties of his post a few weeks ago, retaining a salary and the position of consulting engineer. The deceased gentleman was a native of Edinburgh, and was educated at the High School and University of his native city, where he subsequently practised for some years as an architect and civil engineer. He was one of the most practical and experienced sanitary engineers; and his efforts to improve the health of the British army in the Crimea (where he seriously injured his own) induced Miss Florence Nightingale to write to him, "Truly I may say that sanitary salvation came to us from Liverpool." Mr. Newlands was a gentleman of considerable literary attainments, and he contributed largely to the "Encyclopædia Britannica."

THE THAMES EMBANKMENT.—The select committee on the disputed ground of the Thames Embankment met on Tuesday, the Chancellor of the Exchequer in the chair, and examined at considerable length Mr. Gore, one of the Commissioners of Woods and Forests. He stated that the lands reclaimed from the Thames in front of Whitehall-gardens to Whitehall-place not required for the Crown lessees, or for the purposes of the Embankment proper, was the absolute property of the Crown. He was cross-examined by Mr. Locke, who called upon him to prove the title of the Crown.

TREVELYAN GOODALL MEMORIAL.—Many of our readers must have heard of a movement which has for its object the foundation of an annual art prize in the University College School, as a memorial to the late Mr. Trevelyan Goodall. It was in that school that that talented young artist received his general education. A large number of artists, together with many of his personal friends and former schoolfellows, have formed themselves into a committee to carry out this scheme, which promises to be a great success. Many Royal Academicians and other artists of note are on the committee. Sir Francis Grant, P.R.A., is honorary president of the committee. Mr. John F. Seaton, the treasurer, 163, Camden-road, will be happy to acknowledge subscriptions, and all further information may be obtained of Mr. W. H. Fisk, the chairman, or of Mr. Gaston Fox, the hon. secretary, 175, Camden-road, N.W.

Timber Trade Review.

PRICES, July 17.—Timber per load of 50 cubic feet:—Indian teake, £12 5s. to £13 10s.; African oak, £7 to £8; British Guiana greenheart, £5 10s. to £6 10s.; Cuba sabicu, £8 to £9; Australian ironbark, £6 to £6 10s.; Quebec red pine for yards and spars, £3 15s. to £4 15s.; ditto mixed and building sizes, £2 15s. to £3 5s.; Quebec large yellow pine, £3 5s. to £3 5s.; S. John's and board pine, £3 15s. to £4 10s.; ditto building sizes, £3 5s. to £3 15s.; pitch pine, £3 10s. to £3 15s.; Quebec oak, £6 to £6 5s.; ditto rock elm, £3 10s. to £4; ditto ash, £3 10s. to £4 5s.; large yellow pine masts, £4 to £5 10s.; ditto Oregon, £7 to £9; ditto New Zealand, £6 to £7 10s.; Quebec large birch, £3 15s. to £5; New Brunswick and Prince Edward's Island ditto, £2 15s. to £3 10s.; ditto small averages, £2 10s. to £3 5s.

Mahogany per superficial foot:—Honduras (cargo average), 5½d. to 6d.; Mexican, 5½d. to 6d.; Tabasco, 5½d. to 6d.; Cuba, 7d. to 10d.; S. Domingo, 7d. to 10d.; ditto curls, 16d. to 24d.

Cedar per superficial foot:—Cuba, 6d. to 7½d.; Honduras, 5d. to 5½d.; pencil, 2d. to 4½d.

Maple per superficial foot:—Bird's-eye 5½d. to 7d.

Walnut per superficial foot:—Italian, 4½d. to 5d.; Canadian, 2½d. to 3½d.

Satin wood per superficial foot:—S. Domingo, 9d. to 12d.; Bahama (per ton), £4 to £6.

Rosewood per ton:—Rio, £15 to £25; Bahia, £13 to £18.

Tulip wood per ton:—£9 to £18; Puerta Cabello zebra wood, £6 to £7; Ceylon ebony, £9 to £12; Cuba cocos wood, £5 to £6; Turkey boxwood, £4 to £14.

Flooring boards per square of lin.:—First yellow, 9s. to 10s.; ditto white, 8s. to 9s.; second qualities, 6s. to 8s.

Oak staves per mille of pipe:—Memel crown, £165 to £170; ditto brack, £139 to £140; Dantzg, Stettin and Hambro full-sized crown, £110 to £135; Canadian standard pipe, £77 10s. to £80; puncheon, per 1,200 pieces, £22 10s. to £23; Bosnia single barrel, per 1,200 pieces, £26 to £27; United States pipe, £45 to £55; hoghead heavy and extra, £35 to £45; ditto and light, £30 to £32.

Deals per Petersburg standard:—Petersburg best yellow, £13 5s. to £13 10s.; Quebec first bright, 12ft. 3 x 11, £18 5s. to £19 10s.; ditto seconds, £13 10s. to £14; ditto thirds, £9 to £9 10s.; S. John's first spruce, £9; Wyburg best yellow, £10 to £10 10s.; Archangel best yellow, 3 x 11, £14 to £14 10s.

Waincot per 18ft. cube:—English and Dutch Riga crown, £3 17s. 6d. to £5; ditto brack, £3 to £3 5s.; Memel and Dantzg crown, £3 16s. to £4; ditto brack, £2 to £2 8s.

Trade News.

WAGES MOVEMENT.

NEWCASTLE-ON-TYNE.—The joiners strike still continues. The masters are determined to persevere, and from time to time bring in fresh workmen—principally from Belgium.

LEEDS.—A meeting of the Leeds joiners and carpenters was held on Wednesday in the Circus. Mr. Thomas Inman was voted to the chair. After observing that the committee were as unanimous as ever in adhering to their request for nine hours a day at 7d. per hour, he read a letter, received from Gorpert, promising to support the men out of work, and stating that at Faversham, their case was also being taken up. A bill was then read cautioning the public against parties soliciting subscriptions without authority from the committee to do so. In reply to a question, the chairman stated that no communication had been received from the masters, but he was glad to say that one master (Mr. Thompson) was subscribing to their funds, and that during the last week the committee had seen 35 or 36 men out of the town, they having got work elsewhere. It was then moved and seconded that the meeting should adhere to the notice sent in last December, and the motion was passed unanimously, with applause. A balance-sheet for the week ending July 8th was presented to the meeting, showing an income of £26 11s. 9d., and an expenditure of £24 8s. 3d.; balance in hand, £2 3s. 6d. After a little discussion the sheet was passed as read, the chairman stating that non-society men had been paid at the rate of 1s. 6d. per day. Remarks were then made condemning the policy of the masters in requesting employers in other towns not to engage men coming from Leeds.

TENDERS.

Bow.—Four dwellings, with shops, at Tredegar-road, for T. Maddison, Esq. Mr. Charles Chapman, architect. Quantities supplied by Mr. Bradley:—

W. H. Bragger (accepted) £1,525

HEANOR.—For additions and alterations to National Schools, Heanor, Derbyshire. Mr. S. J. Barber, architect:—

Alcock £266 6 0
Dent 256 0 0
T. & S. Whittaker 250 0 0

HERNE-HILL.—For painting and decorating a house at Herne-hill, for Mr. J. D. Welch. Mr. W. H. Powell, architect:—

Smith £365 0 0
Simpson & Sons 313 14 0
Cowtan & Mannock 232 17 0

HINGHAM GAS WORKS.—Extension of time for tenders to July 29th. Plans and specifications by D. Oldfield, 7, Westminster-chambers, London, sent by return post on receipt of 10s. 6d. in stamps.

LANGLEY.—For the erection of schools at Langley, Derbyshire. Mr. S. J. Barber, architect:—

Alcock £796 6 0
Dent 685 4 0
T. & S. Whittaker 655 13 0

LONDON.—For alterations and repairs to No. 69, Wigmore-street, for G. Barker, Esq. Messrs. Tolley & Dale, architects:—

Ennor £998
Conder 959
Macey 919
Tully 865
Nutt & Co. 850
Sabey 842
Smith 797

OVER DARWEN.—For plumbers' and glaziers' work for a villa at Over Darwen. William S. Varley, Esq., architect, Blackburn. Quantities supplied:—

Sutcliffe (accepted) £178 4 3
Robinson 178 17 0
Horsman 161 18 0

Plasterers' and painters' work:—
Lomax 128 10 0
Jackson 143 0 0
Watson & Isherwood (accepted) 105 0 0

Slaters' work:—
Eccles (accepted) 102 0 0

SMALL-POX, FEVERS, AND SKIN DISEASES.—The pre-disposition to is prevented by Lamplough's Pyretic Saline. Agreeable, vitalising, and invigorating, its effects are remarkable in their cure and prevention. Take it as directed. Sold by chemists and the maker, H. Lamplough, 113, Holborn-hill. [ADVERTISEMENT.]

THE BUILDING NEWS.

LONDON, FRIDAY, JULY 28, 1871.

THE LONDON SQUARES.

SIR CHARLES TREVELYAN has enlarged upon the questions originally suggested in these columns, whether the London squares are not so many spaces from which, for no adequate reasons, the general population is shut out; and whether the aspect of the City might not be greatly ennobled by the removal of their jealous railings. Of course, certain points at once arise: the rights of property involved, the convenience of residence, the utility of these inclosed grounds for the exercise of children; but, although these topics are open to discussion, we leave them at present entirely out of sight. What would be the change in the appearance of the metropolis, were its squares thrown open, some paved, others planted, the principal adorned with fountains, and all embellished by more or less of architectural accessory? The vast area of Lincoln's-inn, within which the Great Pyramid itself might be set down, is a wasted solitude. And what of Brunswick and Mecklenberg, Bedford, Russell, and Bloomsbury, Hanover, Cavendish, and Grosvenor, not to speak of the intensely-dismal Belgrave, or the shamefully-desolate Leicester squares. It has been made a boast that this is an institution peculiar to Great Britain, being totally unlike the French Place, the German Platz, the Italian Piazza, the Portuguese Praca or Largo, and the Plazas of Madrid. We may admit the distinction, without rejoicing over it. For, notwithstanding its many excrescences, Trafalgar-square is undoubtedly an ornament of the English capital. But it is not necessary to turn our mid-London private promenades and playgrounds altogether into expanses of stone, with decorations in bronze or marble. The best of them might be left with their green swards, solitary statues, water-jets, rustic seats, and trees; the eyesores and nuisances are the iron palisades, invariably of a mean and ugly design, springing from a few courses of contemptible brickwork, and resembling nothing so much as the rusted palisades of tombs in old-fashioned churchyards. The idea occurs whether the populace may be trusted with a freedom among rich parterres and greeneries; but it is disposed of by the experience of the parks and public gardens. We are thinking, however, of the change which would be wrought in London, as a panorama, by a conversion of these dreary inclosures into wide and bright reliefs to the long and narrow, the conventional and double-currented thoroughfares. In the first place, the Continental plan has been a strong encouragement of architecture, as may be evidenced by the Place de la Concorde, in Paris; the grand quadrangular centres of Vienna, Berlin, and St. Petersburg; and even the open spaces—now squares, now markets—which are looked down upon by the gilded or Gothic fronts of town-halls, ancient palaces, and historic civic mansions, at Leipsic, at Brussels, at Munich, in Dresden—ay, and in Amsterdam. These squares are gay while they are stately, and ours seem to be shadowed by cypresses. Covent-garden was originally intended to bear a different character, but the architect failed in his design; the situation was bad, and the limits were narrow, so that it became a fitting *halle*, or home of vegetable, fruit, and flower dealers. Leicester, as we have said, is a ruin, and Lincoln's a desert, though both, being regenerated, would improve the buildings surrounding them. What is more desolate than Soho, if we except Pantón, which is, in our day, rather a court? Bridgewater is nearly obliterated, and Queen's, a hundred years ago, was marked by Melancholy for its

own. Excluding courts, often called squares, the metropolis contains about a hundred of the genuine type, which, to ninety-nine parts of its inhabitants, are under lock and key, and useless. The fashionable residents rarely open their gates, except as nursery gardens; the people of the City squares abandoned their lawns and boweries long ago, so that it might be difficult to effect an entrance, unless by means of a pick-lock; the law squares are simply isolations answering no human purpose beyond giving a glimpse of some railed-in grass, and a few besmoked limes and elms. Who enjoys the dull patch in Finsbury, or the monstrous gloom of Red Lion, or the insipid gentility of Cadogan, or the modern primness of Thurloe, Onslow, and St. George's squares? Kensington is old, and so is Hoxton; yet what charm do they bestow upon their respective neighbourhoods? Eaton is very grand, with its monotonous porticoes and façades; Portman and Bryanston are eminently respectable; Montagu breathes of last-century brickwork, and Euston is a horror, though Berkeley has some claim to be styled cheerful; but what a light would be added to London were these hidden oases thrown open, with a fountain here and a pillar there—broad sweeps of pavement, free and winding paths, diagonal carriage-ways, lofty ornamental lamps, houses all round in unison, each with its distant perspective, and attractive of the holiday population. As for the civic squares, their very verdure is sad; their confines are ruinous; they are the receptacles of dirt, squalor, and unwholesomeness. Yet they were not always so. Nor are they now pent up like the exclusive quadrangles of the West Central district and the West-end. Those of Charterhouse, Bridgewater, Devonshire, Wellclose, Warwick, Gough, and Salisbury offer facilities for traffic rather than any chance of ornamental adaptation, and are valuable as reservoirs of air. Yet even in the heart of Barbican splendour once dwelt; elaborate quoins, lintels, and facings still confront a central patch of turf which has all the appearance of being a disused churchyard. But even this is better than the blank brickwork and withered vegetation of Charterhouse. Returning westwards and northwards, however, the fields of Lincoln's-inn were, beyond question, originally laid out for the common use and benefit, whereas they are now utterly silent and abandoned, their turf untrodden, their paths so many ghost walks. But the square will never be, as it might be, a stately ornament to London, while the rails, of purgatorial aspect as they are, remain; and which, while they remain, make it a mockery to call the place a public garden. Soho, no doubt, was once gay, but the blight of isolation has come over it, and it is an unhappy waste, amid four ranges of dismal, though spacious houses. As for Leicester, it scarcely calls for a second mention, being in a state that would disgrace the most insignificant of the French or German municipalities. Nor does Golden need a word, having all the appearance of a mortuary, or Pantón, which society has finally given up. But a part of the town generally derided as dull might revive its former brilliance were the squares spreading round and from Bloomsbury, Russell, Bedford, Brunswick, Mecklenberg, Woburn, Torrington, Gordon, Tavistock, and Euston converted into a series of *Places*, free for all, brightly lighted, fountained, kiosked, and carrying the traffic by ways more various than the rigid and immutable lines of a square. Even the quadrangle which bears the historic name of Fitzroy would thus be redeemed from its character as the most funereal locality in London, worse even than Red Lion, which can put on a smile on a sunny summer's day. Now, these are all socially of the second class, relegated to the commercial and legal aristocracy. But, turning to the first class, or genuine West-end squares, are they much superior as en-

nobling the *coup d'œil* and vistas of the metropolis? They are brilliant by night, yet only rendered so by lighted halls and windows, flambeaux, and the continual glide of carriage-lamps, by glances of rich dress and jewels, and by the throng and dash of equipages. By day they are equally pale, mute, and monotonous. St. James's has a statue, and even a circular pool of water, but both are in its midst, practically invisible to the general public, and only to be admired at ease from among the chimneys. Architecture has done a good deal for St. James's, but only glimpses of it can be seen at a time, and the opportunity of a splendid general view is entirely lost. Pass into the region of dead wall, pastry, and a monstrous George III., happily hidden, which was called after the Berkeleys, and its solitary redeeming feature is the open wooded ground between it and the Green Park. Besides, there is a perpetual pleasure in the sight of those magnificent and robust Oriental planes, upon which Clive and Walpole may have looked. Nevertheless, do the planes look any the better for the iron palings, and if the plea of preserving them is suggested, why not put a seal upon the gates of Kew-gardens? Fancy Gunter's waiters dispensing ices beneath these plane-tree shadows! Now, Grosvenor is a square of still greater pretensions, and might be a delightful retirement, for an hour or two, from the heat and roar of Oxford-street. Its edifices are ambitious, and it, also, has a garden, the usual garden, landscaped after a fashion of which the world knows nothing, and which is a mystery to the up-and-down multitudes of London life—six acres sacrificed, we venture to say, to a false idea, an idea about as rational as it would be in the residents of Park-lane or Prince's-gate to protest against the parks, with their infant myrmidons of all classes. We hardly think of Portman, Montagu, or Bryanston squares as being in point, extensive though the first-named is; while the latter two force upon the mind a picture of private debtors' prisons, so fiercely do those neighbourhoods arm both houses and gardens with iron spikes. Hanover, Manchester, and Cavendish squares were so maltreated by their original builders that nothing short of festalising them, so to speak, by popularising their open spaces, could ever dissipate the settled dullness of their brick, Portland stone, and stucco fronts, which wear the mourning of ages, and weep over their own blackened sculpture and the togaed statesmen who stand or sit, making day hideous, "imprisoned in black purgatorial rails." They may, perhaps, be regarded as hopeless. Their masonry will rot, and their metal rust, long before it enters into the mind of London to exorcise them from sleep, and make a free Leipsic garden, or even a Calaisian *place*, of their imprisoned *pleasaunces*. It might have been thought that, as higher motives of town architecture and arrangement prevailed, and space was less costly, brighter aspects would be created. Yet no. What in art or nature is more barren or forbidding than the central grounds of Belgrave-square? What made less for enjoyment, apparently, than the groves of Eaton; and why is it that suburban people have been so anxious to emulate this dreariness at Camberwell and Kennington? The secret of a metropolitan square, with its rails, and locks and keys, and private right of entry, is, we fancy, that it is supposed to be genteel. This genteel notion spreads itself thinly over a very large surface, however. We find it in the lesser spheres—under different appellations—Trevor and Montpelier, Edward and Pembroke, Alexander and Sloane; and we contrast their affected point with the few good signs there are of change coming over London, even in this peculiar respect. Waterloo-place has something of Continental grandeur about it. Trafalgar-square may one day develop, except in point of size, into a second Place de la Concorde, though a good deal will have to be carted away, and a good deal

added first. The very vacuum in front of the Royal Exchange was a blot among the sepulchral inclosures of the City. Resuming our comparison between London and the cities of Continental Europe, we would remind those who travel of the greatly enhanced effect of town-halls, cathedrals, churches, and theatres standing in the midst of open areas, instead of being blocked up and often concealed by contiguous buildings. The Royal Palace, even at Amsterdam, is encircled by broad spaces. The Cathedral of Antwerp would be lost, excepting its spire, were it buried in a maze of brickwork, as may be easily conceived if we imagine St. Paul's thus shut within a honeycomb of decaying dwellings. The Town-hall of Brussels would never be noticed in a narrow street, nor the gilded columns of the ancient, age-fretted, and majestic palaces, long given to newer uses, that front it; and the Cathedral of Cologne will never be appreciated for its exterior, except by elaborate critics, until a third of the repulsive city, squeezing upon it from every side, has been most consummately and gratifyingly burned down. The monuments of Aix-la-Chapelle would show with infinitely less splendour were it not for that noble square, with its leaping waters and heroic bronzes, whence the outer glories of the Rathhaus, and the high towers of the Dom, may so imposingly be seen. The one ornament of Hamburg is its wide street opening upon the square. But a common remark is that the French place, the German platz, and the Italian piazza are generally used, from week to week, as markets. They frequently are, with no diminution of their picturesqueness or the dignity of the abodes around them; but such a conversion, even if only periodical, is not necessary, and is not universal. It is never seen on the Gensdarmes' Platz in Berlin, the Royal Place of Brussels—which, indeed, is not spacious enough for the purpose—or the Imperial Platz of Vienna. At St. Petersburg it would not be thought of; while the beautiful sweep of square between the Theatre and the Museum at Leipsic, and the Wildstruffer Platz of Dresden, are kept sufficiently sacred, even for English prejudice. Without believing that these examples from the Continent will ever be adopted for London, we imagine there can be no doubt as to their results in the beautifying of cities, and we have thought it worth while tentatively to notice the subject, because it appears to us that in the squares of this metropolis lie great resources for the future.

A RAMBLE BY THE RIVER NEN.

NEARLY every student of architecture prefers at the present day to make his principal sketching tour on the Continent, and we are far from recommending him not to do so. There is very much, especially in the treatment of town buildings, to be learnt from our neighbours, and among the most promising of modern designs are usually those which manifest an acquaintance with French Mediæval art. But in keeping up this acquaintance there is no reason why our own antiquities should be neglected. On the contrary, a thorough knowledge of them is the very best foundation for the study of foreign ones, and in spite of the multitude of architects who profess to take them as models, we are convinced that such a thorough knowledge is by no means common. If the question were asked in what district can the very highest class of English work be found, we could not name the tract of country now to be described. Several northern counties would have greater claims to the honour, containing as they do the remains of abbeys and other buildings of the very first rank. In the valley of the Nen, as far as we propose to explore it, there is but one abbey, though this was a celebrated one, and but one castle, of no historical note. But there is a perfect crowd of minor buildings, and such a collection of towers and spires as can

perhaps be found nowhere else in so limited a space. The villages in Northamptonshire are very near together, and almost every village, if it has nothing else, has at least a steeple worth looking at. The old farm and manor houses, too, have features of interest. In remote corners the Gothic style has hardly died out yet, and the local masons still put up mullioned and transomed windows of many lights. The county is a stone-bearing one—there are stone walls, stone floors, and stone slates everywhere; bricks have only made their way there of late years; thatched cottages are scarce, and half-timbered houses almost unknown.

Northampton, from which we may suppose ourselves to start, is easily accessible from London in about two hours. A branch line of railway connects it with Peterborough, following the course of the Nen, and perpetually crossing it in its windings. The whole distance is some forty miles, there are fourteen intermediate stations, and the district can therefore be thoroughly explored without the need for any great exertion. Beginning with the county town, the small but interesting church of St. Peter well deserves a visit. It is of a late Norman style, with elaborate and somewhat delicate surface ornament; and many of its details have been rendered familiar by illustrations. The Town Hall, built a few years since by Mr. E. W. Godwin, is too well known to require a description. Though not equal in strength and severity of style to the later designs of the same architect, it is a work of considerable interest. The entrance loggia is a noteworthy feature, and the interior of the large hall, in spite of some coarseness in its colouring, is well worth inspection. About half a mile out of the town, past the railway station, and on the road to Hardingstone, stands the finest of the three remaining Eleanor crosses. Placed in a little grassy recess, with a copse, or, in Northamptonshire phrase, a "spinney," for its background, one comes on it unexpectedly, and with something of a surprise. Village crosses have been common, and even now are not rare; but a cross by the wayside is by no means a familiar English feature. In design, this one resembles, though it has, perhaps, always been superior, to that at Waltham. Rising from a base of eight steps, its lower stage is solid and octagonal. At each angle it has a slender buttress, ending in an engaged pinnacle; each face has a panel of geometrical tracery under a delicately-outlined gable. This stage is terminated by an enriched cornice with a singular trefoiled cresting, above which stand twelve slender detached buttresses, placed at the angles of a Greek cross. Each arm of the cross is covered by a hipped and crocketed canopy, protecting a figure of the queen. The third stage is much smaller, square on plan, and decorated with tracery in low relief; while the fourth, of which a fragment only remains, was still further diminished, and octagonal. The cross seems to have been frequently repaired, and there is some doubt whether portions of its detail preserve the original design. But it is still beautiful, in spite both of decay and restoration—though its beauty can hardly be appreciated just now, when crockets, and pinnacles, and canopies enough for several Eleanor crosses thrust themselves on our reluctant view at almost every street corner.

On leaving Northampton, the best way is to take the train for six or seven miles to Castle Ashby. Just before arriving at this station, the tower of Whiston Church may be noticed, on the right hand of the line, looking towards Peterborough. It is freely banded in its lower part with the dark red stone of the neighbourhood, and shows that the Zebra style, as it has been called, was not altogether unknown to our forefathers. Sundry old houses in Northampton are treated in the same way, and Irchester Church, a little farther on, has a lofty tower entirely faced with alternate courses of dark red and white. From Castle

Ashby station a shady lane a mile long leads to the interesting Saxon church of Earl's Barton. Its tower is of considerable size; it is divided into panels by square pilasters and stringcourses of stone, the intermediate surface being plastered. The upper windows—a range of several lights—have flat heads carried by baluster shafts; the lower ones, whose openings are cruciform, have similar shafts, supporting segmental arches. The church, as an archaeological curiosity, is well worth a visit. The next station is Wellingborough, with a large and noteworthy church, and little else to admire. Here the Midland Railway crosses the Peterborough line, and by availing ourselves of it for a few miles we may visit another spot of great antiquarian interest. This is the crypt of, or rather at, Rothwell Church—apparently another Saxon relic, discovered some years since by accident. It is not, however, the building which is the chief object of interest, but its contents. It was the receptacle for an immense multitude of bones—not the accumulation of a village charnel-house in the course of centuries, but the remains of some great burial of which no one now can find a record. The skulls have been picked out and counted, and are said to number thirty thousand; they are, almost without exception, those of full-grown men, and the natural inference is that they were slain in battle. But to what race they belonged, from what battle-field they came, for how many centuries they have lain in this quiet churchyard, it has hitherto been possible only to form the vaguest conjectures. The most probable supposition seems to be that they were either Danes or Saxons, brought here from one of those great fights of which the very localities are now forgotten. Leaving Rothwell, and returning by train to Wellingborough, the churches of Woollaston and Irchester deserve attention. They may both be visited in an hour's walk, on the right-hand side of the Peterborough line. The former has a good spire, which has frequently been illustrated; the latter is remarkable for the coloured bands already mentioned, and also from the fact of its possessing a trefoiled doorway, all but identical in design with one at Keyston Church, Huntingdonshire. The repetition of an elaborate piece of detail such as this is unusual, and in this case, as far as we know, has not been hitherto noticed. Its jambs have attached shafts with carved capitals, and also bear that effective, though not very common, Early English detail which might be described as a reversed wave-moulding. The arch is more elaborate, its principal member being a pointed roll, attached on each side to a circular one, and set off by deep and undercut hollows. Northamptonshire, owing partly to the prevalence of Early work, and partly to the abundance of easily-worked stone, is a good county for mouldings; well-designed examples may be found in almost every church, till the series culminates in the magnificent sections of the great arches at Peterborough.

From Irchester it is no great distance to Rushden, a church which contains a singular piece of internal construction. The arches in the aisle of each transept, having no abutment towards the nave except the columns against which they finished, had apparently begun to push these out of the perpendicular; or, at any rate, it was feared that they might do so. To prevent this, a flying arch was thrown across the nave, from pier to pier; not carrying a wall, which would have shut out the open roof from view, but terminated, at four or five feet high, by an inverted segment, treated as an open-work parapet. This invert has a battlemented capping; under this, and still following its sweep, is a range of lozenge-shaped panels, formed by diagonal tracery bars; each lozenge is pierced with a quatrefoil, and the spandrels between them by trefoils. The lower arch is a very flat four-centred one, and above its haunches are large circles filled with elaborate tracery. The whole is of

white stone, about two feet thick; and if abundance of ornament were the same thing as beauty, it could not fail to be a very beautiful object. In reality it only shows that the fifteenth as well as the nineteenth century produced people who thought that decoration could help them through all their difficulties; though, in justice to a bygone age, we must admit that it did not produce them in anything like the same profusion. The next village beyond Rushden is Higham Ferrars, and this should on no account be missed. There are a number of interesting buildings there besides the church, which is a particularly fine one. Its west doorway, recessed in the thickness of the tower-wall, has a remarkable series of sculptured medallions. The steeple is well-proportioned and lofty; there is work of almost every period, and subjects for a day's sketching may easily be found. A walk of a mile from Higham leads to the railway and to the river, which here, as elsewhere, are not far apart. There is an ancient bridge, of many arches; and going over this, we come to the singular church of Irthlingborough. Its tower, octagonal above, and separated by a considerable interval from the present end of the nave, differs as much from most other towers of the Nen Valley as the Ely ones do from those of most other cathedrals. By crossing the river, however, we have come away from an octagonal tower of another and perhaps better type—that of Stanwick. It is situated two or three miles from the right bank of the stream, and will well repay the walk back again. This is a much earlier style than Irthlingborough; and its belfry windows still retain the circular arch, though each of them is divided by an intermediate shaft into two pointed lights. It has, moreover, a lofty spire—pierced, after the local fashion, with several tiers of lucarnes. Two miles further on is a still loftier one, that of Raunds, the largest and perhaps the most remarkable in the district. Seen from a distance, across the fields, as it rises far above the clustering farms and cottages, its effect is very impressive. It is pre-eminently the feature of the landscape, and it is worth remarking that where Nature had provided no features of importance, our ancestors always seem to have been most desirous of supplying them. It was in the plains of Lincolnshire and Northamptonshire, of Norfolk and Suffolk—not amongst the hills of Gloucestershire, or Herefordshire, or Devonshire, that towers and spires attained their highest development; and the coincidence is a fortunate one, whether designed or unintentional.

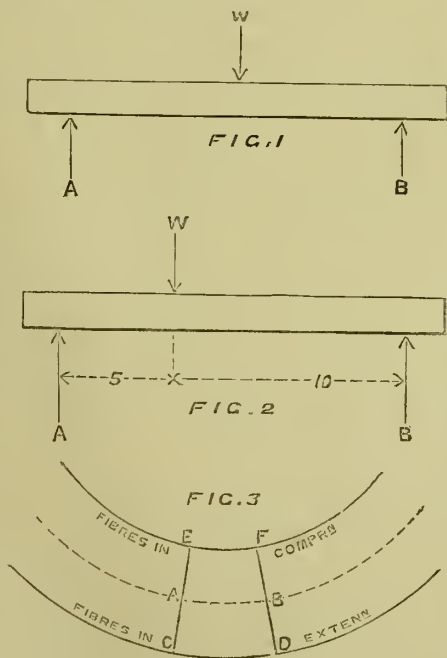
The tower of Raunds consists of four stages. The lowest, as usual, contains the entrance door, recessed some five or six feet in the thickness of the wall. For all practical purposes it is a porch, with an inner and outer archway; each arch being supported by a group of shafts, and a short piece of pointed barrel vault intervening between the mouldings of the two. The next stage, on the three detached sides of the tower, is occupied by arcades. These are different on each face. On the west, the inner order of each arch has two foliated cusps; on the south, the arches are plain, but the spandrels between them are filled with carved trefoils; on the north, they are divided by smaller arches, springing not from shafts or mullions, but from corbel heads. Both here and in the front there are some interesting, though rather dilapidated figures, one of which represents a man playing on a kind of violin. The third story of the tower is singular. The thickness of the wall is here reduced, but the weathering, instead of being horizontal, takes the form of a large W. In other words, the width from buttress to buttress is made up by a whole gablet and two half gablets, which meet at their base. Below the centre stands a two-light window, and four cusped circles fill in the rest. The belfry has an effective pierced arcade. The spire is remarkable for the depth of its brachial, and notwithstand-

ing its height has only three tiers of spire-lights. There is a fine east window in this church, of the earliest type of tracery; some parts of its cusping seem to have fallen out.

(To be concluded next week.)

NOTES ON CARPENTRY AND ON STRAINS IN STRUCTURES.—I.

TO young carpenters a knowledge of the principles on which the stability of timber structures depends must be of considerable interest. The stability of a structure depends upon the dimensions of its various parts being properly proportioned to the strains thrown upon them, and depends also upon the manner in which they are joined together. The business of the carpenter is to properly put together the pieces of timber assigned to their various positions by the engineer or the architect; but he will be much more likely to perform his detailed work properly when he sees as he goes along how the pressures brought to bear upon a structure distribute themselves, and come to their bearing, and in what manner and to what degree the various pieces are strained. To this end we propose to give a short series of articles in which a plain view of these principles will be presented. There are many cases that come under the hands of the carpenter in which a knowledge of the strains produced in a beam or piece of timber by the load placed upon it, or by its own weight, may prevent disaster, or at least may prevent the weakening of a structure by injudicious cutting in the wrong place; for whenever a beam that is subject to a cross strain is to be cut into for the purpose of joining another to it, it must be cut in a part that will weaken it the least; or, in other words, when it is necessary to cut into a beam in order to join another to it, it must be cut deepest where the strain is least; and if it be necessary to cut at all into any part where the strain is great, it must be carefully done.



There are certain mechanical principles which govern the choice of dimensions for a piece of timber intended to be subjected to a given strain, whether that strain be put upon it crosswise, as in the instance of a girder or a joist; lengthwise, as in story posts, in which case the fibres are under a compressive strain; or as in tie-beams, king and queen posts of roofs, &c., in which they are under a tensile strain. This latter form of strain is often met by the employment of iron tie-rods; although in Norway and Sweden immense structures are put together without the use of any iron at all. This is the triumph of carpentry

The strains produced by a load placed crosswise on a beam are those which most often call for determination, and to meet which sufficient dimensions have to be assigned to the beam to sustain the strains without injury to the fibres that are inherent in the material. With what forces to resist strain Nature has endowed the various materials we use can only be determined by experimenting upon them mechanically. The knowledge so gained by experiments on pieces of certain dimensions is then applied to the determination of the dimensions of other pieces by abstract reasoning. With this view we will first present a few observations which have a general bearing on the subject, leaving every individual carpenter to pursue the subject further at his leisure; and it may be said that if he takes interest in his work, and therefore pride in its perfection, he will not stop at simple and general rules, but will investigate the hidden causes and the reasons why certain materials possess the strength to resist strains put upon them that we see they do possess.

Pressure, producing strain, wherever it may come from, on the one hand, and strength of material to resist it on the other, are of universal application throughout nature as two opposite forces. We will begin with a consideration of the strains produced in a beam laid horizontally, supported at both ends, and loaded in the middle.

The first or initial pressure that a beam receives which is thus loaded is the vertical pressure, equal in intensity to the weight W, tending to crush together the fibres of the timber vertically. This vertical pressure is transmitted through the beam (thus producing strains in it) to the supports at the two ends, and the supports react on the ends of the beam with a force equal to the pressure put upon them by the weight of the load, action and reaction being always equal in any structure that has stability. Thus if a weight be placed on firm ground it presses upon it with a force equal to its weight, and the ground reacts against it with a force also equal to its weight; and similarly if a weight be placed on a horizontal beam that is supported at its two ends the action of the weight is met by the reaction of the supports, and the two forces are equal in intensity; and if the load be at the same distance from both the supports, or in the middle of the beam, as in Fig. 1, each support reacts upon the end of the beam with a force whose intensity is equal to half the weight put upon the centre of the beam; that is to say, each support carries half the weight. But if the weight be not in the centre, but at some point nearer to one support than the other, then the supports do not react on the beam with equal force, for the pressures upon them are not alike; and the pressure that each does sustain, and therefore the force with which it reacts on the beam is proportionate to the nearness of the load to it; or, in other words, it is inversely proportionate to the distance of the load from it. Thus if the beam be 15ft. long, or rather if its length of bearing be 15ft., and the load be put upon it at a distance of 5ft. from one end, the support A sustains twice as much pressure as B, because it is twice as near, and therefore it reacts on the beam with twice as much force as B does.

Referring back to Fig. 1, we see that half the pressure of the weight W is transmitted to each support, and that the force of reaction of the support A upwards against the end of the beam is half the weight W, and the same of the support B; so that the same strains are produced in a beam supported at the ends and loaded in the middle as would be produced in it if it were fixed at the points W and A, and loaded at the end B with half the weight W. Similarly, referring to Fig. 2, two-thirds of the weight W are transmitted to the support A, and one-third to the support B, so that the force of reaction of the support A upwards against the beam is

two-thirds of the weight W , and of the support B one-third. And, in short, at whatever point a beam may be loaded, the reaction of either of its supports may be found by multiplying the weight of the load into its distance from the opposite support, and dividing the product by the whole distance between the supports. Thus in Fig. 1, if the distance between the supports were 15ft., and the weight 6 tons; $6 \times 7\frac{1}{2} = 45$, and $\frac{45}{15} = 3$ tons on each support, and in Fig. 2, supposing the weight to be the same, the reaction of the support A will be $6 \times 10 = 60$, and $\frac{60}{15} = 4$ tons; and of the support B $6 \times 5 = 30$, and $\frac{30}{15} = 2$ tons. If the distance of the load were 7ft. from A , and 8ft. from B , the pressures would be, for A , $6 \times 8 = 48$, and $\frac{48}{15} = 3$ 1-5th tons; and for B $6 \times 7 = 42$, and $\frac{42}{15} = 2$ 4-5ths tons, the two making up the whole load.

In transmitting the pressure W to the supports, certain strains are produced in the beam, which tend to compress the fibres together along the upper part of the beam, and to lengthen them along the lower part; and as the fibres are somewhat elastic, they are shortened on the top and lengthened on the bottom of every beam carrying a load in this manner; and it is the knowledge of the limits of this elasticity in different kinds of material that constitutes the knowledge of the strength of materials. If a short piece be supposed to be taken from the beam, and the curves exaggerated for the purpose of better inspection, the strains may be represented as in Fig. 3.

The distance $A B$ may represent the length of any fibre, whether at top or bottom of the beam, before the beam is loaded, and after loading $C D$ may represent its extended length below, and $E F$ its compressed length above, the neutral axis of the beam.

In speaking of the "load W ," and of the reaction of each of the supports in Fig. 1 being equal to half that load, we adopt that mode of expression for the sake of simplifying the question at the outset. In reality, however, half the weight of the beam itself must be added to whatever extraneous load may be put on at W , in order to arrive at the precise amount of force which the reaction of the supports represents. But until we have gone through the rudiments of strains it will be quite sufficient to assume that the beam has no weight.

ON THE HISTORICAL DEVELOPMENT OF ORNAMENTAL ART.

THE fortieth lecture of this course was delivered by Dr. G. G. Zerff, in the Lecture Theatre, South Kensington Museum, on Tuesday afternoon last. In commencing, the lecturer said that it was his intention, in conformity with the principles he had enunciated at the beginning, to conclude the present course by drawing attention to the characters of the three ruling nations of Europe, who were the true representatives of the great Aryan group. In these three nations we should be able to trace both analogies and differences. Endowed as they were with the greatest amount of brain and a regular facial angle, they stood both in science and art in the van of civilisation. Commencing, then, with the French, we should find that French art and the character of the French people were in perfect accordance. Flightiness and childish impetuosity were the principal elements developed under the sunny sky of France, fostered by exhilarating wines, by agreeable social manners. The language of the French was a mixture of Latin, old Frank, and Norman, but now almost without any recognisable Teuton elements. The literature, like that of ancient Rome, was a reproduction of the works of Greek and Latin authors. History was to the French an abomination, and if written was penned only to extol their own deeds. Vanity and self-glorification found their most genuine representatives in France. At the same time, true outward politeness was to be found there. Even in quarrelling the French preserved this. One would say to another, "Will you kindly permit me to observe that you are—a block-

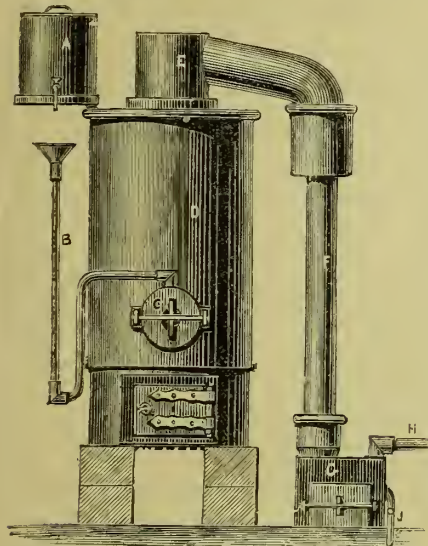
head," and be met with, "Pardon me, sir, I really think you are mistaken, and thus you prove your exquisite ignorance and stupidity." The French liked to laugh, to dance, and to sing. They met death or cooked a dinner with an equal amount of theatrical display. Their greatest talent was their power of *attitudinising*. They were keen, sensitive, and excitable, and therefore unsurpassed in *articles de Paris*. Genuine French art had in reality begun towards the middle of the eighteenth century. The ornamentation of the times of Mme. de Pompadour, now called "Rococo," was the very essence of French art. The arabesques, the little monsters, the angels and nymphs, were all equally coquettish and equally entangled. In art, as in politics, the French seduced and conquered the world at the beginning of a century, and ended by making themselves hated and despised towards its close. They gave us improved patterns at first, and then discarded or transformed them into caricatures. Their language resembled their art in being full of exaggeration. Where we gave "our compliments" they offered "a thousand." Where we were "sorry," they were in "despair." When we were "very well," they were "marvellously so," and when we were "very glad," they were "highly charmed." Every Englishman was to them a man without manners, every German a dull and stupid fellow, too grossly absurd even to excite laughter. French art possessed this character. It was exquisite, light, and pretentious, but at the same time exaggerated, grotesque, and often revoltingly sensational. The French artist's greatest fault was his rough naturalism and mannerism. France had begun this century with the severe and classical style of J. L. David, and was now concluding it with M. Regnault, who had used a pint of, possibly *real*, bull's blood for the purpose of creating a sensation. Between J. L. David and Regnault, we had the Dutelmann, Ary Scheffer (b. 1793), the best French painter. His "Faust and Margaret," however, though excellent in composition, was full of mannerism. He painted everything in green and brown, or brown and green. Yet through these gloomy colours we sometimes saw flashes of a light which, though fitful, could not be mistaken, and proved the presence of the fire of genius. Next to him stood the German, Charles Steuben, who had produced large historical paintings and battle-pieces. Mannerism and broad composition had a yet more devoted servant in Horace Vernet (b. 1798). His battle-pieces were well grouped and full of passion. The colouring, as far as outline was concerned, was bright, sharp, and bold, resembling, to some extent, the touch of Paul Veronese, though without that poetical transparency of colour which was to be admired in the creations of the Venetian master. Even grander was Eugène Delacroix (b. 1799), an opponent of cold, stern classicism. He had painted many magnificent scenes—"Dante and Virgil," "The Massacre of Chios," "The Murder of the Bishop of Liège," "The Shipwreck" (from Byron's "Don Juan"), &c. He delighted in the gloomy, the terrible, the passionate, and the horrible. His "Glorification of the Revolution of July" was a real French masterpiece. It represented the Goddess of Freedom with the tricolour, half fishwoman half divinity. Less terrible, quieter in his thoughts, admirable in his psychological truthfulness and historical individualisation, was Paul Delaroche (b. 1797). Amongst his works were "The Execution of Lady Jane Grey," "Cromwell Standing by the Coffin of Charles I.," and "The Condemnation of Marie Antoinette." The great French painters had, in half a century, fixed on canvas more horrors than had been produced by all the other painters together. But how should we account for the strange fact that this nation, so fond of horrors, so easily brought to admire the sensational and terrible, at the same time decorated rooms with roses, violets, and daisies, and delighted in elegant and charming bronze works like those of Barbedienne and others. It would be difficult to understand this phenomenon—unless, indeed, we accepted the explanation of the witty Graffigny, who told us that the French had escaped from the hands of Nature at a time when she had only had fire and air at her disposal for the manufacture of mankind. Whilst some of the French painters thus delighted in scenes of horror, others painted landscapes. In these works, correct grouping and framing, imposing lines, and a plastic conception of distances were looked upon as secondary considerations. The aim of the artist was effect. Effect produced by little glimpses of sunshine, by dark skies with bloodstained tints or yellowish bands, to mark the rising sun, or white streaks to show the setting moon. Brascassat and Rosa Bonheur were exceptions to the general rule. Their animals were idealised animals. They were able, so to speak, to paint the *souls* of cows, horses, and sheep. The

very reverse of the French in every way were the English and Germans. The Teuton branch of the Aryan race comprehended the Swedes, Dutch, Danes, Germans, English, and Americans. Unlike the Kelt, the Teuton was cool, composed, matter-of-fact, manly, and inclined to be melancholy. The dynamic force with the Kelt was employed in imaginary matters, whilst with the Teuton it was directed to the creation of something *useful*. Liberty and property were the pillars upon which England rested, but having cared for the foundation, it was time to think of our higher artistic culture. The French boasted that whilst they were a nation of *bouquetières* (flower-girls) we were a nation of *boutiquiers* (shopkeepers). We ought to strive to give them no grounds for this assertion. As soon as we should have expelled the evil spirit of commercial jobbery from our educational establishments we should be in a fair way to becoming, in an artistic sense, as powerful as any other branch of the Aryan group. The progress made by England since 1851 was not only astounding, but almost incredible, when we took into consideration the insular position of the nation, and the fact that education had been altogether one-sided, history, geography, and aesthetics having been totally neglected. From Hogarth to David Wilkie, Frith, and E. Nicol we had no historical painters, because history was a sealed book to us. We indulged in scenes of home life, in *genre* painting, and in portraits. With reference to the latter branch of painting we affected a kind of idealised naturalism. We painted Mrs. Jones or Mrs. Brown with great care, so that she might sigh, when gazing on the work, "Oh, would I were like my portrait!" We finished off Johnny, Dick, Louisa, and Emily, so that mamma could say with great pride, "This is how the dear child looked before she had the whooping-cough." In water-colour painting, in painting dogs and horses, in building neat little cottages, and in constructing grand railway bridges or tunnels, we were unsurpassed; but when we attempted a monumental building, we either left it unfinished or placed it in a crooked street or narrow lane where it could not be seen at all. With regard to ornamentation, he (the lecturer) had only to refer to the Exhibition to show the decided improvements which had taken place in this branch of art. There was, however, much to be desired. The neglect of higher mental culture was apparent. There was a want of refined taste and of classical severity. Taste we might acquire in studying French art, classical severity and correctness in directing our attention to the works of the different schools of Germany. It was useless to attempt to disguise the fact that, spite of our gigantic improvements, our superior collections of art, antiquities, treasures, and models, we were not in the van of the aggregate of Aryan nations. The common phrases, "We are not an artistic nation, we are practical," were meaningless, and were as absurd as the counter phrases which might be used by a metaphysical German, "I am not practical, I am æsthetic." National onesidedness was as reprehensible in an Englishman as in a Frenchman or German. We had not only to study French art, and to note what was passing in Paris, but to examine the works and systems of the schools of art at Vienna, Munich, Düsseldorf, and Berlin. If we noticed the wall in the International Exhibition which was decorated with the Bavarian pictures, we should find the word "sold" on nearly every one of them. We should observe harmony of colours, an exact study of tints, an aerial perspective, an adherence to Nature without a tendency for *sensational* contrasts of light and shade, and taste in grouping both the ideal landscape and the mere view. The German was slow like the growth of his oak-trees. In general he was phlegmatic and sentimental, but he above all liked a system. He knew that the universe had its laws and a system; that humanity had developed according to laws and a system, and he observed the same in every individual being. This made him the very opposite of a Frenchman, who was *light-hearted*, whilst he was melancholy and *heavy-hearted*. He wanted to do everything thoroughly and to understand everything. This metaphysical tendency did not prevent the German painter, sculptor, architect, ornamentist, designer, and artisan from being practical. In addition to his universal knowledge, his powers of generalisation, and his talent for systematising, he was eminently technical. He knew the advantage of a correct knowledge of anatomy, but quite understood that this knowledge without *ideas* would never enable him to produce a work of art. This truth was also recognised by the authorities and the students of all art-schools in France and Germany, and not only the eye and the hand, but the intellect also was cultivated. In concluding, the lecturer observed that his aim throughout the course of which this was the last lecture had

been to make his hearers acquainted with the different developments of artistic forms and motives in architecture, sculpture, painting, and ornamentation, and above all to inspire the students with a better appreciation of their art and with higher ideas. With regard to the study of art history itself, he might observe that a school of art in which that subject was not taught was unknown. Art could as little exist without history as life without oxygen. The students, he continued, ought to show their appreciation of the efforts made by the authorities of the department to provide them with instruction in this all-important subject by not relaxing their efforts to render themselves thoroughly masters of it.

IMPROVED PORTABLE GAS APPARATUS.

MESSRS. KENDALL & GENT, of Salford and Manchester, have recently commenced to erect apparatus for the manufacture of gas from coal oil, on Myers' improved principle. The apparatus is



very simple, and easily managed. A is a circular can, furnished with a small tap, and holds the oil from which the gas is produced. B is a siphon-pipe, fitted at the top with a funnel mouth, and fixed at its other end to a neck or pipe projecting from a cast iron retort. C is the projection of the retort referred to, into which the siphon-pipe opens, and it is closed in the front by a small cast iron cover, tightened and kept in its place by the iron placed across it. D is a cylindrical sheet iron casing, containing a cylindrical and vertical cast iron retort. This retort is suspended by a flange at its top, and is surrounded by a fire-clay cylinder; the intervening space between the retort and the cylinder constitutes the flue or hot-air passage. The hot air or flame, after passing round the whole of the retort, is carried up through a sufficient height of pipes to create the necessary draught for the fire under the retort, or may be conveyed, by means of an elbow-pipe, into an ordinary chimney, should there be one convenient. The space between the fire-clay cylinder and the casing is filled up with concrete or any material that will hold the heat. E is an elbow-pipe, fitted at one end into a trough at the top of the retort; the joint is made tight by filling the trough with lead, which also acts as an indicator, showing, by its quiet boiling motion, that the conversion of oil into gas is in successful operation; the other end of the elbow-pipe fits into a trough at the top of the condensing-pipe, F, filled with water. The heat of the retort is just sufficient to keep the lead in a melted state, and the escaping gas is not of such a temperature as to evaporate the water in the other joint. F is the condensing-pipe, fitted by a socket at the bottom to a shorter pipe, which penetrates into the cast iron cistern G, and terminates under water. The gas is conveyed from the cistern G through the pipe H to the holder. I is a small fire-grate, in which fuel is burnt to heat the retort. J is a small pipe used to carry off any tar that may accumulate in the cistern G; a similar pipe is fixed to the top of the condensing-pipe F, and conveys tar from the top of the water-joint. The cost is less than that of coal gas, when the difference in the brilliancy of the light is taken into consideration, and the apparatus is free from the defect which has previously characterised attempts to manufacture gas from coal oil—viz., the coating of the retorts with carbon.

ON MOSAIC AND GLASS PAINTING IN THE INTERNATIONAL EXHIBITION OF 1871.*

By T. GAMMIE PARRY, Esq.

Mosaic.

THE USE OF THE ART.

ENGLAND is assuredly the country for mosaic. We need its durability and its lustre. Where other systems of Art would only make darkness darker, lustrous mosaic multiplies upon its thousand surfaces every gleam of light, and reflects the very reflections of itself. It might seem at first a mere thing of ingenuity. It needs both ingenuity and skill; but besides them it needs for its perfection a fine tact and a bold discretion which can only come of artistic talent and education. The trained care of a neat-handed artisan will suffice for its simple decorative work. For high art is needed high training.

In mosaic applied to the higher branches of art, a thorough knowledge of the principles of design and chiaro-oscuro, especially in the action of the human figure, is indispensable; for as the intricacies of painting are impossible in mosaic, and indeed ought to be so, to insure the effect of power and breadth, which are the finest characteristics of mosaic, the artist needs a true sense and an accurate knowledge for that scientific selection of parts (whether for their omission or emphasis), which would be out of the question to the blundering guess-work of one not trained by an artistic education. The history of art is written in mosaic. In the relics of Egypt, Assyria, in those of Greece, when Byzantium had taken the place of Athens, and of Rome, when Christianity had revived her arts afresh, over the world, from India to England, and under all the vicissitudes of national prosperity and decline, mosaic has preserved the record of styles of art and of the influences of national character and religion upon it, from the earliest historic days till now. If this art is to revive and flourish as in other days, its hope is in the devotion of its students. The English student is already well provided with the sources of information. The works of one gentleman alone, Sir Digby Wyatt, on this and its kindred subjects, supply all that a student could hope to learn from books in the history of the art, the detail of its materials and handicraft, with admirable instruction on its principles and application, and references to important foreign works and illustrations of the art. The lecture by the Right Hon. A. H. Layard, printed among the papers of the Royal Institute of British Architects, for November, 1868, and that by Sir D. Wyatt in the same series, for 1862, are valuable both for the archæology and practical information they contain. These two papers reprinted together would be of great value for circulation among art students.

The ancient wall-mosaics were composed almost exclusively of vitreous tessere. The pavements were of every variety of material and colour. In the 1st chapter of the Book of Esther the pavement in "Shushan the Palace" is described as of "red and blue, and white and black marble," a sort of intarsiatura mosaic.

The ancient earthenware tessere had not the durability of glass; but the novel process by which the ceramic tessere are made by a crushing pressure upon dry pounded clay, affords all prospect of durability otherwise unattainable by terra-cotta. The Romans, in England, commonly used the local materials for their mosaic floors—blue lias, gray forest stone, yellow oolite, brick burnt red or black, or any other material at hand. Accumulated rubbish has preserved what time would otherwise have ruined of such perishable materials.

Mosaic was but little used in our national Christian architecture. Buildings of the same style in Italy abound in mosaic; and those of the East, and others in Christian countries erected under Saracenic influence, have their interiors clothed with it. Nothing can surpass the richness of its beauty. Its resources are unbounded, from the solemnity of its works at Ravenna and Venice, in Salonica and Sicily, to the gorgeous dome of the more modern St. Peter's at Rome, and the minute brilliancy of its copied pictures.

THE PLACE OF MOSAIC AMONG THE ARTS.

Mosaic is to painting what painting is to nature; not its copy but its sense. In former days such men as Andrea Tafi and the artists of St. Apollinare and St. Prassede, designed their cartoons and worked their mosaic upon them. But those were days when time was of small value. Nowadays the artist who designs would grudge the time spent in the arrangement of his tessere. The work of the mosaicist

is, therefore, a speciality, and is more than half an architectural one. His palette of colours, like that of the buon-fresco painter, is limited; it ought to be so, and severely so. Let him heartily accept these limitations, and restrain his hand from liberty, for they insure a breadth and grandeur to his work which the resources of facility and delicacy would risk.

A mosaic is a translation; but to be a perfect one, it needs to be made with so fine a sense of the genius of the two languages that a native on each side would recognise it as his own.

PRINCIPLES OF MONUMENTAL ART.

Colouring, taken as a monumental art, must consent to dispense with many qualities of a picture. Their loss may be painful in an isolated work, but in monumental art nothing is isolated. Painting need lose thereby neither refinement nor vigour. If obtrusiveness is a vulgarity in men, it is infinitely more objectionable in art. Self-restraint in art need deprive it of no power. Its evidence would rather add to its power. Art might thus indeed be thrown back upon itself, and rest upon its own fundamental resources. But if it were so, its very independence would give it dignity; and, being master of itself, it would become thereby master of the spectator.

A picture, speaking broadly, can have but one point of sight. A building has none. The spectator makes one for himself whichever way he turns. The variety and charm of architectural effect is due to this, so that all is symmetry, all is true, whichever way the eye may be directed. Why, then, make discord by inventing other points of sight which the architecture ignores? The painter, or the designer for mosaics, does so, who, in his limited view of art, designs and paints for architecture as he would for his gallery. If, on the contrary, the principles of monumental design were studied and realised—if artists, even Royal Academicians, would condescend to learn the grammar of another important language—the language of combination—art would then rise to that high standard which unity can alone attain. It would command again, as it did of yore, the respect of the very multitude; it would make them think where thought had no place before; it would gain first their assent, at last their affection, and make a people honourably proud in the possession and the power of national genius.

If monumental art is to be again, it must be by the courage and the power of such principles as these. None other can realise it. Monumental art is at once a multitude. Mosaic is but one of its many instruments. The designer for mosaic must, at least in knowledge, be a mosaicist himself, and as much an architect at heart as a painter. Orcagna, Ghiberti, and Cellini produced works most beautiful and complete, because they grasped at once the purpose of their thought, and the powers, the limits, and the applications of their materials. For want of such comprehensive grasp as this, our modern works too often fail. That noble inspiration which once animated the arts is needed now to teach them to combine, and both to give and gain by combination. The beauty of a crown would be marred if one gem paled the rest.

For all minor purposes of decorative painting men may do what they please. When they are bound by no architectural obligation they are free; and in a room, whether it be of the size of a boudoir, where Bouchet or Watteau may have let their fancies loose, or of the size of the chambers in the Vatican where Raffaele painted his "School of Athens," the rule of the artist must be his own discretion. Where, on the contrary, he has to deal with great architectural features and effects, let him remember that incongruity is discord; and that where the architecture has demanded breadth and massiveness, his work is grievous if he ignores them.

Artists should be half mechanics. They think now too little of construction. They are apt to think that mechanism and construction are things of prose, and that art aspires alone to the realm of poetry. We can only hope for a future of better things and better understandings. Unless a designer of monumental art can conceive and master, in one mental grasp, the poetry of construction and the construction of poetry, he had better leave that noble art alone.

Orchestral harmony owes its charm to the many voices of its instruments. It is not enough that they be tuned together or maintain their parts; but it is that each one singing out its own poetry, in its own sphere, in its own voice—discreet, unselfish—combines to make sound perfect.

Thus, too, there is a harmony, pure, complete, and true, as much needed by the eye as by the ear. The cautious discipline of the orchestra is no less needed for its perfection than it is by those many-voiced instruments of art which make the music—silent

* From the Official Reports of the International Exhibition, published by Johnson & Sons, Castle-street, Holborn.

though it be, and all the more sublime—of monumental architecture.

NOTICE OF SPECIAL SYSTEMS AND WORKS.

The system of mosaic painting invented by Mr. Minton Campbell is the most remarkable novelty in the fine arts department of the Exhibition. The sensation caused by the German invention of water-glass was very great, but the success is doubtful. The three most important works executed in England have been entrusted to this precarious system. Two of these works, the greatest in size and the most successful in execution of modern works of historical wall-painting, Mr. Machise's Waterloo and Trafalgar, have been finished but a few years, and are already rapidly perishing. The third, by Mr. Herbert, may last much longer, because of the extreme caution with which he used water-glass. May it last for ever! But what is water-glass? It is the delicate film which shines on the golden surface of our autumn straws of corn. It serves, by the exquisite provision of Nature, to preserve the slender stalk—but how long? Till the time of wintry trial comes and then water-glass and straw are gone together. It is too delicate, too superficial.

Mr. Minton Campbell's system is an application of mosaic tesserae to ordinary painting. It is not mosaic; but it combines the mechanism and durability of mosaic with the freedom of oil-painting. A surface of mosaic tesserae of any extent may be painted as a man would paint canvas. The surface thus painted may be broken up into groups of tesserae; and painting, which, though treated like oil, is in fact vitreous, may be burnt in by the furnace. Thus, like mosaic, it becomes, as far as mortal man dares to use the word, imperishable. It may be altered; any number of "pentimenti" may be possible, and the work may be burnt in again and again without injury to the rest. Thus wall-painting is secured by imperishable enamel. Never were two systems more opposed than this and water-glass. The one was "unstable as water," but this is fire-glass.

The palette of the buon-fresco painter was limited to the colours that would bear the ordeal of quicklime, and they were few. His very difficulties brought out his power. His colours were few, his lime was rapid, breadth and simplicity were his necessity, and their result success. But this new process breaks down all limitations both of colours and their use.

Regarded in relation to the higher view and purpose of a painter's work, as a method which is to supplant fresco, and to take the place of mosaic, the future which Mr. Minton Campbell's system opens to the art-world will be the making or marring of art, according to the self-restraint or easy license of those who use it. Without discipline and self-restraint, all dignity, order, beauty, health, are gone, whether it be in politics, religion, morality, or art.

The system of Mr. Minton Campbell's fictile painting is well illustrated by the figure of Ghiberti, by Mr. Fisk, and a group of a Hunter, his Hawk, and his Dog, by Mr. Marks, in a room of the Western Fine Art Gallery.

The use of true mosaic is well shown in the admirable execution of Mr. Leighton's figure of Cimabue, by Miss Cole. As a piece of pure architectural work, which mosaic must ever be, it is infinitely superior to the free painter's work in the figure of Ghiberti, executed in Mr. Minton Campbell's process. They are both on a flat gold ground. The mosaic treatment of breadth, and extreme simplicity of shadow, in the figure of Cimabue, unite in perfect architectural keeping with the gold background. Mr. Fisk's figure, excellent as a piece of free-picture painting, does not suit its place at all; it looks like a piece of canvas cut out and laid on a gold ground, incongruous and unexplained. In this result lies the danger of perfect freedom in wall painting, to which the buon-fresco painter and the mosaicist were not exposed. Free work is liable to want that dignity which is indispensable to the associations of monumental art.

Mr. Salvati's works, in the same room, exhibit, by their simplicity and breadth, the true decorative art of mosaic in connection with architecture. They are in colour also mellow, rich, and grave; as such a purpose demands.

There are several works in mosaic such as the figure of Gibbons, in this room, which exhibit the very disagreeable result of the tesserae obtruding themselves on the sight. The beauty of mosaic is in its result—its ugliness is in its construction. This should never be too clearly visible in representative subjects. By its character of powerful and simple breadth, let a work be known at once to be mosaic, no matter where it be, high or low, dark or light; but be careful not to agonise the eyes by forcing upon them the grating surface of obtrusive tesserae.

It is hardly necessary to add that such caution is not intended to apply to ordinary decorative work of geometrical designs, such as those of pavements, panels, and so forth. In higher works of art the eye should not be distracted by the mechanism of the work.

In the Pottery Gallery (in the East wing) are some remarkable specimens from the works of Messrs. Simpson & Co. They exhibit all styles of work, from the vigorous pictorial head of Inigo Jones to the broad and simple uses of mosaics, where good effect at small cost is a matter of necessity. Their application of flat decorative work to tiles is as good as their mosaic. The employment of tiles for figure painting is well worthy of notice in the figure of S. Luke. Other methods by other persons, of using tiles for figure subjects, may be examined at the end of the Ceramic Gallery of the South Kensington Museum.

The student is further referred to the specimens of enamel colours, "smalti," exhibited from the Imperial Academy of Fine Art at S. Petersburg, and from our English mosaicists, Messrs. Maw and Messrs. Rust.

In connection with this subject must be mentioned the use of coloured opaque glass inlaid upon walls by Messrs. Powell, of Whitefriars.

Let no one, however, suppose that these enduring materials of tiles and mosaic will stand against the effect of damp inside walls. The damp must come out; and, with the irresistible power of its invisible steam, will blow up any mosaic, and smash the incrustated tiles and glass, just as the tender roots of ivy or still more tender fungus will break to pieces the stoutest masonry.

Glass Painting.

THE USES AND PRINCIPLES OF THE ART.

This art is more nearly allied to mosaic than any other. The principles on which they rest are the same. The golden rule of them both is that all design must have respect to materials and to the place which the finished work will occupy. The revival of the art in this country has been due to those influences which have made this a great church-building age. This art has suffered from being treated as an easy one, and artists of small attainment, and without any approach to a scientific knowledge of colour or of drawing, have trusted to the beauty of their materials to let their own shortcomings pass unobserved. It is only to be explained by public inaptitude, that after so many years of experience in the revival of this art, systems of work should be patronised at great cost which do violence to the first principles of art itself. Not only is the beauty of the material degraded to the effect of semi-transparent tracing canvas, oiled paper, or parchment—nor is it merely that archaeological taste is violated by the confounding of styles; but, worse than all, this art seems to be taken as a fair field for pretension to the highest flights of genius by the most daring compositions, when, all the while, every feature of drawing and every point of composition only exhibit the painter's reprehensible self-confidence. We do not look for refinements of anatomical drawing in the designs of old windows, nor do we demand them of our modern glass painters; but what we do demand is, that they shall give us glass windows, and not mawkish transparencies, where all the vigour and glory of their material is blotted out, and all the glancing and exhilarating effect which should be its object and its pride is toned down to one dead level of soft and sentimental insipidity.

It might be invidious to particularise, but the student and cultivated visitor will judge for themselves, and be led to hope for the time when public taste will be better trained to allow such works no more. They are the more reprehensible, because, now the materials of glass are so well understood by the manufacturer, and those qualities of translucent radiance and refraction to which the old glass owes much of its charm, are completely reproduced, and within the reach of all. By this no extreme criticism is intended, as though it were to insist on the use of a glass bare and nude of all the toning of metallic oxide; what is regretted is the want of discretion and judgment in its use. In the fine specimens of that late quasi-pictorial work in the chapel of King's College, Cambridge, and in Fairford Church, there is plenty of toning enamel; but, at the same time, the openings of clear glass are in such plenty also, that, arranged with all the cunning of true art, the mellow parts are all the more mellow, and the glowing effect of clear and gorgeous colour all the more superb. The eye is filled and not fatigued.

With foreign glass-painters the habit of blinding their glass, or coating it with a fog, is excessive. They appear to ignore the glories of old art, and to aim at a sort of opalesque tranquillity of effect by uniform smoothness of surface best suited for the

exhibition of their picture-like transparencies. The fault of the system is that it turns windows into mere picture-frames, and perverts an architectural opportunity to the service of a subsidiary art. The duty of a glass-painter is precisely the reverse of this; and happily there are professors of this beautiful art, both foreign and English, who follow the grand old traditions with the utmost success. This Exhibition does not at all fully illustrate the present conditions of the art, for some of its leading artists have sent nothing. The galleries of general exhibitions are bad places for glass paintings. Everything depends on the works being properly placed. The range of their character and use is as wide now as it was formerly between the little crisp panes of a fifteenth century Nuremberg house, with the quaint sharp designs of its refractive grisaille, and those broad and grandly sober sheets of glass which fill with stately figures of old saints the lofty clerestories of Bourges. But in exhibition-buildings designed for other things these exigencies of the art are left to the visitor's imagination. So no wonder that glass-painters are shy of exhibitions.

For domestic purposes, where a soft enamelled window may be needed against a glare of sun, or some ornamental glass required to screen unsightly things outside, or for halls and passages and what not, a painter's whim may range as he pleases; but when we approach to monumental art, then there is but one standard for the glass-painter and his critics. He works side by side with the mosaicist, the sculptor, the wall painter, the workmen in marbles, woods, and metals, and pre-eminently with the architect himself, to produce a great result, the excellence of which depends upon its unity. If a work individualises itself, the unity is broken. If one art so loses its own dignity as to quit its own sphere in the ambitious rivalry with another, as the glass-painter does who leaves his glorious endowments of light and colour to mimic (and that in vain) the subdued beauties and the scientific composition of the art of picture, then again the links of monumental unity are broken.

By such considerations as these it may be judged how pre-eminently difficult the arts of the mosaicist and the glass-painter really are. They are possessed of such transcendent powers that in their use the highest education and finest judgement are needed.

Of the countless purposes to which these two arts may be applied we need say no more than, with this caution, that they are arts and not manufactures. Their patrons need as much education as their professors. When applied to ever so great a purpose each art must be great enough to hold its own. When applied on never so small a scale or to never so subordinate a purpose, pure art is always a joy; but bad style, bad drawing, incongruity, ignorance, sensuality, vulgarity, selfishness, and conceit, are always and everywhere insufferable.

The purest ambition of an artist is to instruct his fellow-men, to direct their sympathies, and to raise their idea to that standard of excellence which his own life of labour and devotion has ever striven to attain. In nothing is it more true than in art that pride cometh before a fall. The truest artist will ever live in humility and hope, and will die with his alphabet upon his lips.

NOTICE OF SPECIAL WORKS.

The best foreign work in this collection is No. 2403, by Von Swertscoff, in the Pottery Gallery. Its bold design is admirable for its purpose, which, instead of filling a window in a small room, and close to the eye, is rather that of giving splendour to a distant architectural effect. If the artist had used the coarse refractive glass, such as the gorgeous windows of Mediæval and Renaissance art would have had, his painting would have gained immensely in force and richness; and, if he had been content to leave, here and there, more of such glass, free from the enamel which smooth "good" glass from its poverty and weakness needs for its support, his effect would have been perfect.

In entire contrast to this are Messrs. Heaton & Co.'s refined illustrations of "Elaine," in the Meyrick Gallery. With domestic glass, which this is, anything is allowable within the range of good taste. Designs of this character and refinement will only bear to be alone. Their extreme tenderness is marred by their incongruous position in Gothic windows filled with crisp and vigorous grisaille, relieved with points and lines of powerful colour.

Messrs. Ward & Hughes's windows are always rich in colour. Their illustration of a subject from the Book of Revelations is a good specimen of their peculiar treatment of gorgeous colour massed together: one only longs for a little more of it to be free from the woolly stippling. Their little double window, with the women and angels at our Lord's sepulchre, is a very refined specimen of their style.

Their group of "Industry" is gracefully designed and richly coloured. If this subject and those of Messrs. Heaton & Co. could change places each would benefit. Messrs. Hughes's subject overpowers the delicacy of its grisaille ground; Messrs. Heaton's vigorous ground overpowers the delicacy of their subject.

No. 2376 (south-east staircase), central window, by Messrs. Gibbs, is an effect of painting in elaborately stippled and softened enamel.

Nos. 2394 and 2395, Meyrick Gallery, Belgian windows, by Mr. Vander-Poorten, are specimens of the style of work referred to in the introductory notice above. They have not a single character of glass left, except that its pieces are jointed with lead. Its effect is thoroughly realised for what it is intended to be—viz., that of a transparent blind. I leave these and all similar works to the discriminating student, who can recognise the broad rule that works of art are good or bad as they are conceived in relation to their materials.

No. 2375 (north-east staircase), by Mr. Dobbelaere, is worthy of special notice as a specimen of dead colour enamelled figures on a rich and clear but deeply-coloured ground.

Messrs. Lavers & Co.'s specimens of renaissance glass deserve special notice. Their central window, in the north-west staircase (wrongly named in the first edition of the catalogue), is a rich and beautiful work—a picture in an architectural framework. Taken alone upon its own peculiar conditions, it is a success. A similar style of window, by the same hands, but not quite so complete, is in the Meyrick Gallery.

Messrs. Mayer's works, in the Meyrick Gallery, are the usual specimens of Munich glass, with all their specialities of artificial enamelling. Such is the window of "Hamlet." In the window of the "Adoration of the Magi" is a specimen of the Munich style of glass with a more architectural intention. It has, as usual in works of this school, that harshness and almost savageness of effect in its chiaro-oscuro and its colours, which fatigue the eye by their violence and unbalanced intensity. The special characteristics of English and German Gothic are so distinct that the ornamental accessories of the one are rarely harmonious with the framework of the other.

No. 2402, Meyrick Gallery. A series of panes of corrugated glass, with subjects in outline. They are to illustrate the use of glass in galleries and rooms where the desideratum is to hide some unsightly objects outside. When such is the case it is necessary that the designs, which must be incessantly thrust upon the eye, should be as good as possible.

The application of photography to window ornament is illustrated by Col. Stuart-Wortley's fine photographs in the conservatory, and by those of M. Joubert, both plain and coloured, in the South Kensington Museum collection.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.

ON Thursday evening last, the 20th inst., the above-named society held a meeting at their rooms in Conduit-street. The President, Viscount Stratford de Redcliffe, K.G., G.C.B. in the chair.

A most interesting paper was read by J. T. Wood, Esq., Architect, descriptive of his explorations at Ephesus in search of the Great Temple of Diana for which it was anciently so much famed. Ephesus, Mr. Wood reminded his hearers, was the most important of the twelve cities founded by the Greek Confederation, the chief mart of Asia Minor, and above all famous for its magnificent temple dedicated to the Goddess Diana. It would be remembered also as one of the seven churches mentioned by St. John. The site of the great temple has been a subject of dispute and controversy for many centuries. Many intelligent men, such as Chandler and others, had looked about in vain for some traces of the immense building. Seeing nothing above ground that really answered to the description given by Pliny, Strabo, and Vitruvius, they generally came to the conclusion that the large building at the head of the city port, commonly known as the Great Gymnasium, either formed part of or was built upon the site of the temple. Pliny describes the temple as being 220ft. wide, and 425ft. long, and adorned with 100 columns, 27 of which were the gifts of kings. Dr. Guhl came much nearer the real site when he suggested it might have stood near the river Cayster, nearly north of the city. About eight years ago Mr. Wood determined he would seek for the site of this celebrated building by diligent exhumation of the accumulated soil,

debris, &c. He began at his own expense. Subsequently Mr. Waddington, of Paris, assisted, and then the British Museum authorities, acting under the advice of Mr. Charles Newton, who visited Ephesus on his way to Priene, where Mr. Pullen was at work on the Temple of Minerva. Finding all efforts barren on the supposed sites of the temple, Mr. Wood resolved to open up some of the other important buildings, hoping to come on some inscription or other guide which would advance the main object he had in view. This in a remarkable manner he effected. He excavated about the Great Gymnasium, the Odeum, or Lyric Theatre, and the Great Theatre. Near the doorway of the Odeum was found the statue of Commodus, the lower part of which is now in the British Museum, the upper part was, unfortunately, lost by the wreck of the vessel conveying it. Through stumbling one day over a stone, and thus having his attention directed to it, Mr. Wood's curiosity was excited by its appearance, and on excavating there he laid open what he considers to be the tomb of S. Luke. The building is circular, 50ft. in diameter, decorated with 16 columns and pilasters. Mr. Wood's opinion of the nature of the building was founded on finding the pilaster which had first attracted his notice; the cap, being above ground, had two sculptured panels on it, representing a bull supporting a cross, and a larger cross. The trustees of the British Museum having made him a small grant towards the exploration, Mr. Wood, by their wish, opened up the remains of the Great Theatre (doubtless, the building referred to in the 19th chapter of the Acts of the Apostles), and here discovered a number of interesting inscriptions; one of them, of great length, recording various gifts of treasure, votive statues, &c., with which the celebrated Temple of Diana was endowed, and regulations for carrying its sacred objects in procession. The priests of the temple, accompanied by guards, were to be met at the Magnesian Gate by the young men of the city, who there took part in the procession, and helped to carry the images, &c., to the theatre. After the assembly the young men accompanied the procession to the Coressian Gate, whence the images, &c., were carried back to the temple, thus making the circuit of the city. The inscription occupied several large slabs of marble, and described particulars at great length. This inscription gave the first clue to the discovery. By tracing round the city wall, Mr. Wood found the gate referred to (the Magnesian Gate), and judged from its peculiar position there must be two roads leading from it, one leading off in a southerly direction to Magnesia, the other northerly towards Ayasalouk. By clearing away the accumulated soil, &c., at the gate, 10 or 11ft. deep, he found the roads, and choosing the one which was most worn, that leading towards Ayasalouk, continued opening it up, the road showing two distinct sets of chariot ruts. During the hot summer months, the work had to be discontinued, but in the ensuing season, 1868-1869, the opening of the road was continued. By the sides of the road were discovered numerous tombs and sarcophagi, as also the piers of the portico of Damianus. At the latter end of the season, a road was found branching out towards the open. From the fields here being covered with barley, the road was not cleared further, but a point fixed on at a distance of half a mile to which the road tended, and which had before excited his suspicion. There excavations were made, and a thick wall, built of large stones, lighted upon, which he concluded must be the Peribolus wall. Extending the excavations along the wall, two inscriptions were found, which proved the supposition was correct, and it became evident that the precincts of the Temple were reached, this being the wall built by Augustus. After tracing the wall 1,000ft. northward, and 500ft. eastward, the excavations were again suspended for the hot season. In the autumn of 1869 the exploration was again proceeded with, laying open the walls of the Peribolus and, by sinking numerous trial holes within the inclosed area, after two months, some masonry, which appeared to be the remains of an important Roman building, probably belonging to the Augustium. About 16ft. from the surface, some inscriptions were found referring to votive offerings. One of them was from an architect named G. Scaptius Frontianus, who had been honoured by employment in the temple. Towards the end of December, 1869, the site of the Temple was actually found, though not proved beyond doubt until the next season. At the bottom of one of the pits, 400ft. from the Augustium, a white marble pavement was found 9in. thick, evidently of Greek workmanship. The joints were rubbed and carefully fitted. It was laid on another course of stonework. Also part of a column, with sculptured Persian figures on it, part of a python, or some other gigantic monster, and the drum or

frustum of a column of colossal dimensions. Soon after these promising discoveries, the rain set in, and the pavement 20ft. under ground, was soon under water. In the end of the season, 1869-70, long trenches were opened in the field where the pavement was found, giving abundant proofs that the search of seven years had at length succeeded. A long range of Roman buildings, from west to east 700ft., was cleared, which seem to flank an open space on the north side, and which Mr. Wood supposed to be in front of the temple. In this Roman building was found a mosaic pavement, in a good state of preservation—the subject, a triton with a crooked stick, and a dish of fruit, with a fish carrying a trident. This has been taken up and cased ready for its transit to England. The next season, that of 1870-71, commenced with vigorous operations in the field where the Greek pavement had been found. A group of stones, frusta of a column, were soon found, of large dimensions, which having fallen athwart a well, remained supported at a higher level than the rest of the building, the lowermost drums were missing; there was also a fragment of a capital, and near was found the entire capital of another column of the Grecian Ionic order. A base was also found *in situ*, showing that the columns were 6ft. 1in. in diameter, and consequently that they were probably as much as 57ft. high. Pliny says 60ft. This, and the position of other bases, showed from their level the remarkable fact that the pavement first discovered belonged to a sort of crypt which extended under the building, the height between the two floors being nearly 8ft., the upper pavement being supported by dwarf columns, numerous fragments of which remained. Mr. Wood found no remains of the cella walls, but lighted upon two distinct fragments of smaller columns, which doubtless belonged to the interior of the temple. A quadrangular space was eventually excavated, 210ft. long by 130ft. wide, to the depth of about 14ft.; but in consequence of the rains, nothing more could be done, the water rising at one time to the height of 7ft. above the lower pavement, and did not subside lower than 4ft. 6in. before the works were suspended. With regard to the much-disputed point of Greek polyhromy, Mr. Wood found distinct traces of colour, vermilion, on many of the fragments of sculpture, on the dwarf columns, and on the moulded member of the base of the column found *in situ*. The flutings of the column near the base are 8 $\frac{3}{4}$ in. wide, elliptical in plan, and the dividing fillets a full inch in width. The upper member of the base consists of a large torus, nearly a foot deep, which is fluted horizontally with nine delicate flutings, separated by narrow fillets; the lower edge being chamfered, and a narrow fillet being left where it comes in contact with the lower member, which Mr. Wood supposes to have been to prevent damage from slight shocks of earthquake. The next members of the base are two bold scotie, divided and terminated by delicate astragals and fillets, on which were the traces of colour distinctly visible. The lower stone was a square plinth; an unusual feature in the base of the Grecian Ionic. The great depth of 20ft., the difference between the present and ancient level of the site, has been caused chiefly by the accumulations of sand brought down from such parts of the neighbouring mountains as are composed of mica schist, and which has caused the whole plain of Ephesus to be silted up to the average depth of 12ft. In addition, on the site of the temple is the debris of buildings and deposit of vegetable matter. Mr. Wood stated that he should return to Ephesus next month to continue his exploration.

At the conclusion of the paper, Mr. Newton, Professor Donaldson, Mr. Hyde Clark, and Mr. Penrose, addressed the meeting.

Mr. CHARLES NEWTON bore earnest testimony to the courage and perseverance of Mr. Wood under the dangers, difficulties, and disappointments of his undertaking. He was not, he said, sanguine at the first about success in the matter, and nothing but Mr. Wood's unconquerable enthusiasm and resolution could have succeeded in meeting those innumerable difficulties which such undertakings were liable to, and which only those who were engaged in them could rightly estimate. Now he expected much. There was little doubt, he thought, but that a rich harvest awaited them in inscriptions and sculptured remains, for though the early iconoclasts showed a determined enmity to figures in the round objects of worship, they had not the same aversion to mere ornamental sculpture, and therefore friezes might at least be expected to be found. He was happy to say that though the present Ministry had received an evil reputation for over-strict economy, yet that on his representation of the case to the Chancellor of the Exchequer, a liberal grant had been made for the completion of

the research. The remains of this temple would be of immense value in perfecting the series of early Greek architectural remains in the National Museum, a collection which had no rival in Europe, and of which we might justly be proud.

PROFESSOR DONALDSON alluded to the moot point as to whether the Great Temple was an octastyle or decastyle, which would now be set at rest.

The other speakers having addressed the meeting, and thanks being offered to the Chairman and Mr. Wood for his interesting paper, the meeting separated.

SUBCELLÆ.

THE four Subcellæ we illustrate this week are sketched from a fine collection of Miserere or pater noster, originals as well as plaster casts preserved in the Architectural Museum. Most of them are exquisitely adapted to their position, and all fully charged with that quaint conceit which characterises the works of our Mediæval fathers. The massy nature of the Miserere afforded a rare block for wood sculpture in high relief, and the concealment of the bracket beneath the seat gave it a good chance of preservation. So here the old carver could revel in his labours, although many of his best productions are far more rude in sentiment than in execution. As many of our readers are aware, the Miserere is the socket-hinged seat of the stalls, which, when lifted up at an angle of about 45°, allowed the tired Roman Catholic ecclesiastic a kind of support during the long services of the church; although it has been suggested—an opinion which we do not endorse—that the patience-seat is a thing of the past, to be associated with labyrinth pavements and needle-eye passages, and that its real intention was to exercise the watchfulness of the clergy of the period throughout the services, as the treacherous block would descend with a reproachful bang at any moment of forgetfulness on the part of the sinner. Anyhow, the adoption of the seat was very general, and there are some beautiful examples at Wells, and in Henry the Seventh's Chapel, Westminster.

O. W. D.

NEW SHOREHAM CHURCH, SUSSEX.

NEW SHOREHAM, formerly called Shoreham or Schorham, is a small unattractive town situated about six miles west of Brighton. Its church, however, is a splendid exception to the general mediocrity of the churches of Sussex, and as a specimen of that mixed style which intervened between Norman and Early English is exceedingly interesting. As to the exact date of its foundation or by whom it was built, little has really been determined. Domesday Book, which was completed in 1086, makes no mention of New Shoreham whatever, neither is it named in the charter of the foundation of Beeding Church, in which deed, dated 1075, William de Braose, the first Norman lord of the manor, bestows upon the monks of S. Florentius, of Saumer on the Loire, Beeding, Bramher, and Soarham Churches, besides certain appendages in wood and lands, the Soarham Church recited being that dedicated to S. Nicholas, now called Old Shoreham. Phillip de Braose, the successor of William, confirms this grant when going to Jerusalem, and the deed wherein this confirmation had been made then further states, "But the said Phillip returning from Jerusalem earnestly coucudes and confirms to them, because the right of the aforesaid monks thereto existed, the Church of S. Mary, of Haura Soraham." New Shoreham is dedicated to S. Mary, and is obviously the building herein described as Haura Soraham, which belonged by right to these monks, having been built by them on the lands of Shoreham, previously bestowed upon them by the older Braose. It therefore appears that the church was not erected prior to the departure of the second Braose, which took place, doubtless, at the first crusade in 1096, when general enthusiasm led all ranks to the expedition. Between this time and the return of Phillip from Palestine in 1100, the Holy City having been taken in 1099, the church was chiefly erected. We learn in another deed relating to Fescamp, in Normandy, that the said Phillip was certainly in England in 1103. From these data the natural inference is that the church of New Shoreham belonged to the community of S. Florentius at Saumer, and that its erection was commenced in 1096. When entire it was a stately, capacious edifice of a cruciform plan, having a lofty tower rising from its centre. All that now remains is the choir, at present used as the parish church, the south transept and tower. In the east front, the subject of this week's illustration, are three beautiful lancet windows with clustered columns, below which are three semicircular arches with small windows. These arches

interestingly illustrate the gradual growth of style from the Norman to Gothic; the columns and mouldings being of the Early English, though the arches are circular. The enrichment, of which a detail is given, is rather uncommon. The gable is pierced by a circular window which is a good example of the early wheel form, filled with small shafts and semicircular arches converging to one centre. On each side is a lozenge quatrefoil and the whole is surmounted by a plain cross. The walls of the choir, which rise considerably higher than those of the transept, are supported on either side by flying buttresses; features really found of so early a date in England, though it appears that on the Continent they were used earlier, as at La Petite Eglise, S. Die, in France. The length of the choir is divided into five bays by octagonal and clustered columns of moderate height, the capitals of which are of beautifully sculptured foliage, and the outward members of the arches are enriched with similar carving, disposed in a series of small branches waving round a pattern of rare elegance. The walls of the aisles are endowed with semicircular arcades fretted and foliated. The tower displays the same mixed style as the choir, having two tiers of windows, the upper semicircular within pointed arches, and the lower semicircular. This church has not yet been restored (!).

MAURICE B. ADAMS.

EXTINGUISHING FIRES WITH GAS.

A COMPANY in New York, says the *American Gas-lighting Journal*, proposes to introduce the use of carbonic acid gas as a means to be employed instead of water in extinguishing fires. It is claimed that carbonic acid gas can be delivered through the steamers at present used by the Fire Department as easily as water, and with far greater effect. To prove this to be the case, the company propose to make a public trial of their invention on a large scale. At the last session of the Legislature a law was passed authorising the company to lay pipes three feet beneath the level of the streets for the purpose of conveying their gas. It is their purpose shortly to avail themselves of this permission, by carrying pipes from one of the reservoirs of the Manhattan Gas Company, to a vacant lot distant two miles and a half in the upper part of the city, upon which an ordinary three-story building is to be erected and filled with material of the most combustible character. The building is then to be fired and engines summoned in the usual manner. On their arrival the hose will be attached to the gas pipes of the company and the firemen will proceed to extinguish the fire with carbonic acid gas. This experiment will, it is estimated cost, 30,000 dol., but so great is the confidence of the managers in the success of the scheme that they feel justified in the expenditure of this large sum on a public test.

PROPOSED REMOVAL OF COVENT-GARDEN MARKET.

ON Monday a special meeting of the Market Gardeners, Nurserymen, and Farmers' Association was held at the Bedford Head, Maiden-lane, Covent-garden, under the presidency of Mr. H. Meyers, to consider the question of removing the business of Covent-garden Market to Farringdon Market. The meeting was a large one, and the proceedings of an excited character. The chairman and several speakers addressed the meeting, and from their statements it appeared that the refusal of the Duke of Bedford to afford proper accommodation to the stall-keepers in the market, whereby they suffered considerable loss, was the cause of the present movement. The consequence of his Grace's refusal was that in wet weather the stalls were flooded—the water standing five or six inches on the ground. One speaker, who was corroborated by others, said that Mr. Gye, the lessee of the Royal Italian Opera premises, had asked the permission of the Duke of Bedford to open the Floral Hall as a fruit and vegetable market, offering at the same time to indemnify his Grace against the expense of alterations, and to pay 25 per cent. on the tolls. His Grace, however, refused the offer. Under these circumstances the market gardeners and stall-keepers felt themselves compelled to look out for some other place. Application had been made to the Corporation respecting the site of Farringdon Market. The plans of the proposed improvements at the latter place, prepared at the instance of the Markets Committee of the City of London, by their architect, Mr. Horace Jones, were laid on the table, and inspected by the meeting. The Chairman then read a letter he had received from Mr. Bontems, of the Architect's Office, Guildhall,

stating the Markets Committee were not quite prepared to speak definitely as to the question of rent, but when ready to do so they would ask the Association to meet the Committee. Mr. Rudkin, Common Councillor, explained the plans, and assured the tenants of the old (Farringdon) market that the Corporation were not antagonistic to their interests. The interests of the old tenants would be the first to be considered. There was a larger area in Farringdon Market than in the other suggested site, near the new meat market and if the site between the railway and the new meat market were fixed on, the streets in the neighbourhood must be widened to accommodate the additional traffic, and the stall-keepers would have to pay the cost. At present Farringdon Market was almost a dead letter in the hands of the Corporation, as it brought them in only £350 a year. It was intended to lower the market to a dead level with Farringdon-street, and to do the same with Stonecutter-street, just leaving an incline sufficient to carry off the water. As to rent, he could say in his individual capacity—not pledging the Corporation—that the rent would not exceed that paid in Covent-garden. Within a month he thought the Corporation would be able to provide the needful accommodation. After further discussion, a deputation consisting of five vegetable growers and five florists was appointed to wait upon the City Markets Committee as to rent, tolls, &c., and to report to a future meeting.

SCIENCE AND ART DEPARTMENT.

THE following are the chief results of the Science and Art Department, which have been lately reported to Parliament, and are about to be published:—

The numbers who during 1870 have attended the schools, museums, and other institutions receiving Parliamentary aid considerably exceed those of 1869. There is a very large increase in the number of persons receiving instruction in science applicable to industry, which has risen from 24,865 in 1869 to 34,283 in 1870, or upwards of 37 per cent. The number of individuals instructed in art has also increased from 157,198 to 187,916, or 19·5 per cent. The lectures at the South Kensington Museum were attended by 27,761 persons. At the Royal School of Mines there were 17 regular, and 124 occasional students; at the Royal College of Chemistry, 121 students; at the Royal College of Naval Architecture there were 40; and at the Metallurgical Laboratory, 24. The evening lectures at the Royal School of Mines were attended by 2,574 artisans, school teachers, and others; and 243 science teachers attended the special course of lectures provided for their instruction. At the Royal College of Science, Ireland, there were 17 associate or regular students, and 21 occasional students. The various courses of lectures delivered in connection with the department in Dublin were attended by 1,152 persons; and at the evening popular lectures, which were given in the Edinburgh Museum of Science and Art during the session 1869-70, there was an attendance of 1,195. The total number of persons, therefore, who received direct instruction as students, or by means of lectures, in connection with the Science and Art Department in 1870 was upwards of 254,000, showing an actual increase, as compared with the number in the previous year, of 67,000, or nearly 36 per cent., and an increase in the rate of progress of 8 per cent., the numbers in 1869 having been nearly 28 per cent. higher than in 1868.

The museums and collections under the superintendence of the department in London, Dublin, and Edinburgh have been visited during the past year by 1,847,929 persons, showing an increase of 49,087 on the number in 1869. The attendance at the Art and Educational Libraries at South Kensington, and at the library of the Royal Dublin Society, continues to increase—the number of readers in 1870 having been 1,809, or 3·7 per cent. more than in the previous year, the respective totals being 48,244 in 1869 and 50,053 in 1870.

The returns received of the numbers of visitors at local art and industrial exhibitions, including the Workmen's International Exhibition at Islington, to which objects were contributed from the South Kensington Museum, show an attendance of upwards of 816,000, the number in 1869 having been 338,000. Thus, it appears from the returns of the different institutions and exhibitions by means of which instruction in science and art is afforded in connection with the department, that the total number of separate attendances during the year 1870 has been upwards of 2,973,000, or 25 per cent. more than in 1869, when it was 2,372,000.

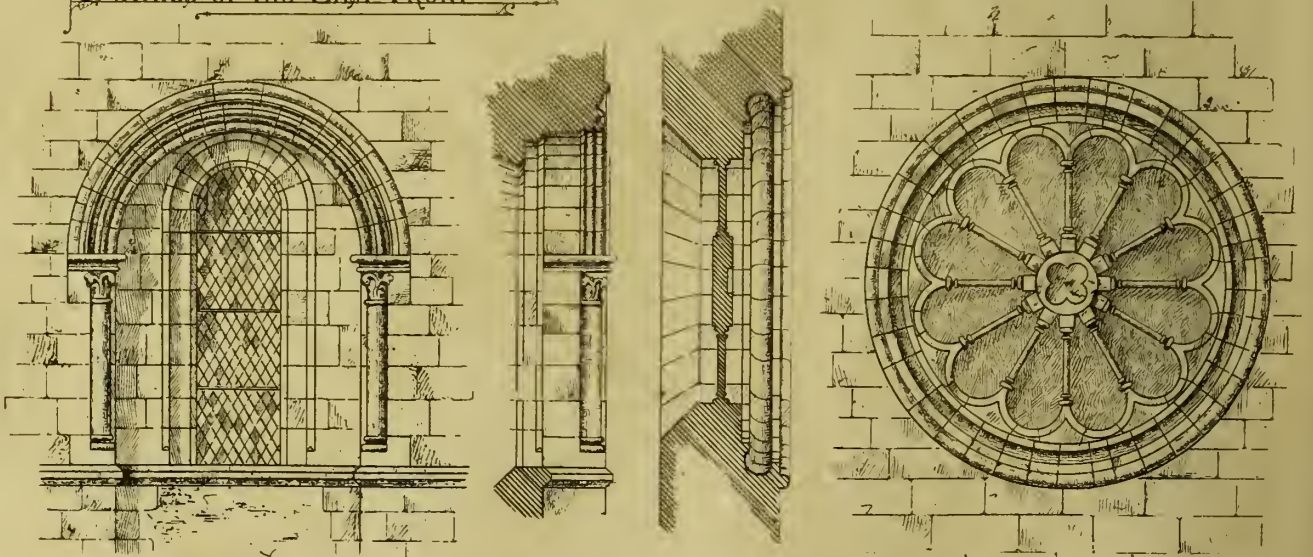
The annual dinner of the workmen employed by Messrs. Green and King, of New Bond-street, took place last Saturday at the Rye House.

NEW SHORCHAM CHURCH SUSSEX
ELEVATION OF THE EAST FRONT
SCALE: 8 FEET TO AN INCH



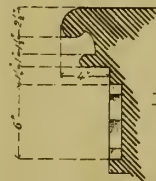
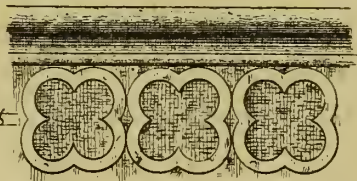
MEASURED AND DRAWN BY MAURICE BARNES

NEW SHORCHAM CHURCH SUSSEX
DETAILS OF THE EAST FRONT



ELEVATION & SECTION OF LOWER WINDOW SECTION & ELEVATION OF WHEEL WINDOW (restored)

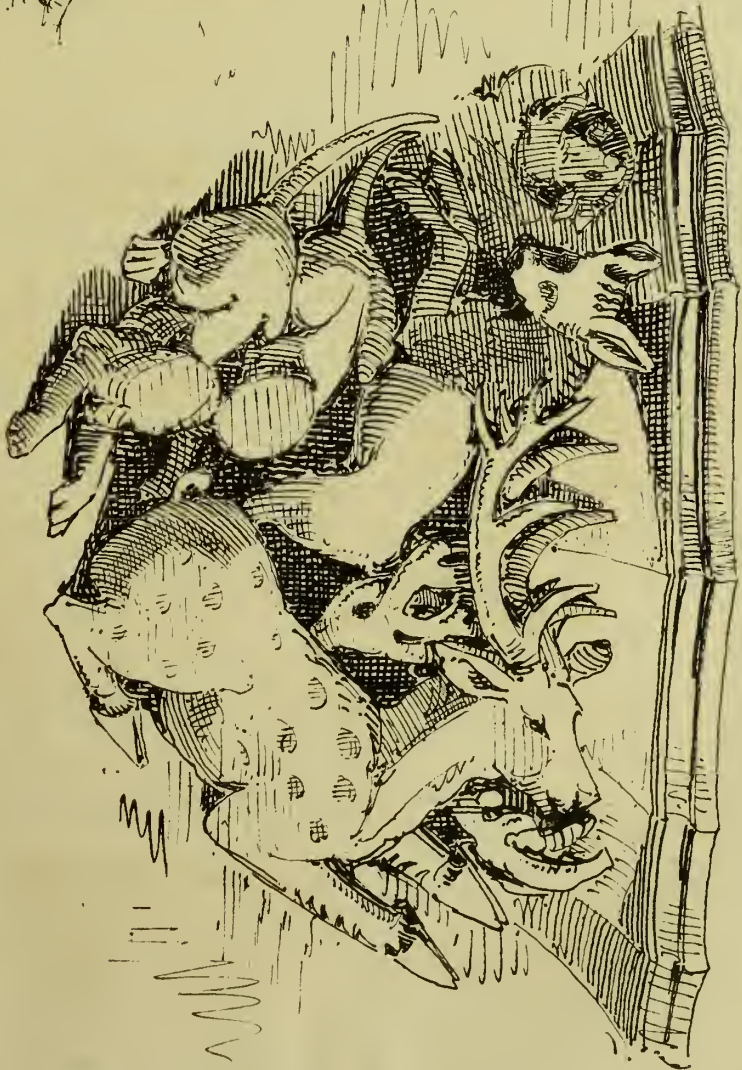
ENRICHMENT
UNDER UPPER WINDOWS



SECTION
1 INCH SCALE

SCALE OF 8 FEET TO AN INCH

MEASURED AND DRAWN BY MAURICE BARNES
APRIL 1871



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THE NEW LAW COURTS.

BY EDWARD W. GODWIN, F.S.A.

MR. JAS. FERGUSSON is the author of the "History of Architecture." He is art-critic to the Committee for the Completion of S. Paul's. He seems to act as if he were retained in the same capacity for the Government; and not satisfied with these mundane honours, he actually aspires to a knowledge of the secrets of the grave, and criticises from the standpoint of a spirit-medium. Writing of Mr. Street's latest design for the New Law Courts, now on view in the library of the House of Commons, he says: "Could we call up a real Gothic architect from his grave, he certainly would have roofed this court over, out of respect to the more delicate constitutions and effeminate habits of the present day; but as certainly he would have done it so as to obstruct the light and the free circulation of air to the smallest possible extent." I do not dispute anything Mr. Fergusson or any other medium may choose to say about departed spirits, but such a passage as that just quoted, occurring, as it does, nearly at the commencement of a signed article in the pages of a professional journal, is quite sufficient to make the most devout believer in its author hesitate in accepting only dogmas from what an American might call such an almighty source. After this, of course, no one can be surprised to find Mr. Fergusson is *en rapport* with the public mind, the lawyer mind, and every other mind. It will be remembered that Mr. Street, in all his designs, like almost every other architect who competed for the Law Courts, provided a hall, or *salle des pas perdu*. There was, however, this point to be noted, that Mr. Street's hall was comparatively a small one. All his designs show this hall with a groined roof, and well lit at ends and sides. I do not pretend for a moment to impute any wrong motive to Mr. Fergusson, but always to describe such a hall by the word "vault," and once to use the words imperforate and gloomy in connection with the word vault, must give the reader who is ignorant of the design an utterly false bias. No one, as far as I know, ever describes the nave of Westminster Abbey by the single unqualified word "vault." The single word, to an architect, merely refers to the roof or ceiling. Tombs built below the level of the ground, arched cellars, and occasionally crypts, are sometimes called vaults by partially educated people. Such persons, it may fairly be assumed, would derive from Mr. Fergusson's criticism the notion that Mr. Street had designed a low, dark, cavernous, crypt-like place, to please nothing but his own morbid fancy, and at a cost of "between £50,000 and £100,000" (a rather wide estimate). Now the hall is really 48ft. wide; it is more than 80ft. high internally, and more than 140ft. high externally, to the top of the finial of the gable; the lights of the windows are 4ft. 6in. wide, and the windows themselves are more than usually large, each containing about 300ft. of glass. This beautiful hall—one of Mr. Street's very happiest efforts—is the "vault" which so offends Mr. Fergusson. And now having seen how our art-critic can describe a modern design, let us see how ingeniously he connects his description with his marvellous insight of the public mind:—"The truth of the matter is, nobody wants this vault except Mr. Street. The public do not want it; the lawyers do not want the vault; the Treasury do not want it." Perhaps not: not the vault, according to Fergusson, "imperforate" and "gloomy;" but the hall, according to Street, is quite a different matter. The fruit may be perfectly sweet, however much one may desire to think it sour.

So far Mr. Fergusson has attempted nothing beyond describing what the departed would do could they return to us, and what the nation thinks of a matter on which, as yet, it has neither uttered nor indicated any opinion. If we turn to the argument for a moment, we

find such a sentence as this:—"It (Mr. Street's hall) is not Gothic in any true sense of the term." Why? Because Mr. Fergusson says so; or, to adopt his own words, so far as his knowledge goes, "no Gothic hall on anything like the same scale, and applied to civil purposes, was ever vaulted during the middle ages in any part of Europe." So, then, no building can be Gothic in character unless you can show a Mediæval precedent for its size and its use combined in one example. Does it require one word to show even to the very partially educated the utter absurdity of such an argument? If Mr. Fergusson does not know the difference between a lofty, light, pleasant hall and an imperforate gloomy vault, it can hardly be surprising that he should fail to perceive the difference between a living developing style and a Mediæval precedent.

Last of all we have this art-critic's opinion: "I have no hesitation in saying it is the meanest design for the principal front of so important and pretentious a building which has been proposed in our day." He admits it may be excused, because "the expense of the whole has been so cut down that there are no funds available for a larger or more imposing façade;" but he goes on to say that the architect has no reason to complain of the lack of funds if he spends so much of the money on a hall. Is it not apparent from his own admission as to the cost, that in common justice and in common sense there can be no comparison made between this design and any of its predecessors? The length of the present Strand front is just over 500 feet, that of the competition drawings was 700 feet. We must bear in mind, too, that towers are omitted from this last design, apparently by order, for I feel sure Mr. Street would have wished something more important than that at the east end, which by courtesy must be called a tower, but the walls of which are actually not higher than the gable of the hall.

If I may be allowed to offer an opinion, the design now submitted appears to me better than anything Mr. Street has yet proposed, in spite of the deficiency of funds; and if I take the liberty to qualify my view it is because I believe the architect is too strong a man to refuse to listen to the reasons which a brother architect may advance in support of an utterly unprejudiced opinion. I think, then, that the building would be better without any tower, unless funds can be found for one both larger and higher than that shown. A tower for such a building should be 200 feet high at least, and certainly more than 40 feet square. I have heard that such a tower was once proposed by the architect. Why can it not be subjected to the criticisms of the House? The windows in the upper story of the buildings, each side of the great hall, are if anything too wide, and I cannot help thinking that it would have been far better, for many reasons, to have preserved in these the proportions of the windows in the upper story of the buildings at the east end. The gallery over the porch to the central hall is peculiar, but one line to the coping would rectify it; and here, as in one or two other instances of this front, the temperance of horizontal lines so admirably introduced in the other elevations is wanting for repose. Were I writing for the general public, I should say that the main tendency of the design is to an excess of liveliness and picturesqueness rather than to that severity which ought properly to characterise a building devoted to such a solemn purpose as the administration of the law. And, in saying this, I cannot help thinking that it would be much wiser if anonymous authors of criticisms and unknown writers of leaders would restrain themselves a little, and not write on designs they have never seen. They give publicity only to a tissue of mistakes, and assume things to be which have no existence. Now and then the style of the writing becomes conjunctive, a style which has nothing to support it but the recommendation of Fool Touchstone.

I must not put down my pen without calling attention to the aspect of Mr. Fergusson's criticism from another point of view—the time when it is published. Mr. Fergusson knows, or ought to know, that the contract for foundations which has been signed and is actually being carried out includes the foundations for the hall to which he takes exception. He knows, or ought to know, that his chief denunciation of this hall—viz., that it was useless because it was not a thoroughfare—must fall to the ground directly Mr. Street's plan is published, for the hall is at least the entrance for all the witnesses and jurors, and directly from this hall lead the staircases for those important sections of the public who have business with courts. The Exchequer critic, of all men, ought to have known the condition of the plans, that not merely eighth scale drawings had been prepared, but that hundreds of drawings to a half-inch scale and details one-eighth the full size had been drawn in the most careful and finished manner. Knowing all this (and if he did not know what can be his value to the Government in a public or private capacity?) is it not somewhat late in the day to endeavour to raise an outcry?

THE SHAKESPEARE NATIONAL MEMORIAL.

THERE is yet a chance that Shakespeare may be honoured with a "national memorial" after all. And why not? Why not, we ask—if Balfe is to have one, and Thackeray has one, and Tom Spring, the prizefighter, has one, and Herbert Ingram, the inventor of Old Parr's pills and of the *Illustrated London News*, has one? Yet it will be in face of sore discouragement, and after many disappointments, that the author of "Hamlet" will secure the distinction of a national memorial effigy, if he succeed in securing it at all. Our readers may recollect that some years ago, on the approach of the tercentenary of the poet's birth, a great movement was got up with a view of doing him honour, at the head of which were Mr. Hepworth Dixon, the then editor of the *Athenæum*, Mr. Flowers, a brewer at Stratford-upon-Avon, the Duke of Manchester, and others. A great many committee meetings were held, and subscriptions were invited, and promised to the extent of some £2,200, of which about £1,200 were received in cash. But still the great "national" monument hung fire, owing chiefly to disagreement amongst the managing body, till eventually a select committee was formed, which included the name of Mr. Wm. Cowper (now Cowper-Temple), which one fine day issued an ever-memorable report, recommending, as a fitting tribute to the immortal bard, the erection of "a monument embracing a statue." This was an idea too stupendous, too complicated for the wildest imagination to grasp, and accordingly the thing came to a standstill, amidst much doubt and misgiving, and has remained as a myth of the past (Shakespeare's memory still struggling above the waters of Lethe), until revived last week at a special meeting of the surviving subscribers, convened for the purpose of agreeing how to dispose of the very modest balance remaining in the hands of the trustees.

At this meeting, which we are informed was attended by "some dozen gentlemen," Sir Wm. Tite, one of the treasurers of the fund, presided. After some desultory discussion as to the causes of the failure of this great "national" movement, the gratifying fact was elicited that, out of the sum of somewhere about £1,200 odd actually received on account of subscriptions, only £975 had been paid for expenses, leaving a balance of about £280 in hand. Mr. C. L. Gruneisen moved that, in order to get rid of the affair, this balance should be paid over to the Royal Dramatic College, a languishing institution for the relief of worn-out actors, who, "in their day," so said that gentleman, "had

performed the creations of Shakespeare," though with very unsatisfactory results, it would seem.

This proposed act of malversation called up Mr. Hephworth Dixon, who, as a lawyer himself, and as advised by another of the "most eminent counsel living," declared that the diversion of one farthing of the funds in hand from the original purpose of "doing honour to the memory of Shakespeare" could not be accomplished except by Act of Parliament, or with the consent of every individual subscriber (or, we presume, the legal representatives of those deceased). He then gave a hint about "calling in" the subscriptions which had not been paid (about £800 or £900), and added that "they could have for £1,200 a very good statue on the beautiful Thames Embankment." Anything like a practical suggestion, with an estimate appended, has a wonderful effect upon an English audience; and so it happened that, no sooner had Mr. H. Dixon sat down, than up sprang Mr. Richardson-Gardner, who volunteered, "if Mr. H. Dixon's proposition was carried out, to add two hundred guineas to the fund," and that in the midst of the applause which greeted this announcement, Mr. Cosens undertook to add a further similar amount; and that, to crown all, Mr. H. Dixon himself was so carried away by the success of his venture as to announce that "rather than see the scheme which he cherished so long fall through, he would himself undertake to raise one hundred guineas." So, as we said at starting, poor Shakespeare may hope to be rescued from undeserved oblivion after all, his name being handed down to posterity in "a very good statue on the beautiful Thames Embankment," at a cost of some ten or twelve hundred pounds, which sum, if procured, we hope may be raised at a less rate of outlay for expenses than three or four hundred per cent. If, on the other hand, this new whip for funds should fail, Shakespeare may, perhaps, have to be made famous "by Act of Parliament," in the shape of a measure for re-appropriating the balance of a subscription abortively attempted in his behalf.

H. O.

ON ARCHITECTURE AND ITS RELATION TO MODERN LIFE.*

BY AN ARCHITECT.

An examination of the theory of architecture, which can only imitate the principles of Nature, would lead to an investigation of the causes of beauty itself—the qualities which always accompany it. This is the most subtle and difficult inquiry connected with the arts.—*Sir Charles Eastlake.*

Parmi les arts, l'art de l'architecture est certainement celui qui le plus d'affinité avec les instincts, les idées, les mœurs, les progrès, les besoins des peuples; il est donc difficile de se rendre compte de la direction qu'il prend, des résultats auxquels il est amené, si l'on ne connaît les tendances et le génie des populations au milieu desquelles il s'est développé.—*Viollet le Duc.*

FROM whatever causes, it is certain (and every one who has given attention to the subject will bear us out in the remark) that for twenty persons capable of taking an enlightened and intellectual interest in music, painting, and sculpture, we scarcely meet with one who has any interest in architecture, any knowledge of its principles of design, or indeed any suspicion that there are principles at all concerned in the matter. It is true that the tide of revived Mediæval feeling which has of late years flowed over this country has rendered fashionable among non-professional persons a certain interest in one particular phase of the art of architecture. But even this has in reality amounted to nothing more than the acquirement of a superficial historical knowledge of certain facts connected with this one style, combined with a free use of what may be termed "Gothic slang;" and our popular writings on the subject in the shape of "manuals" and "hand-books," are nearly all the work of amateurs—chiefly clerical dilettanti—who confound Archaeology with Architecture.

On one point, however, all persons will probably concur with us—namely, that something called "Architecture" has involved, and will probably continue to involve, the expenditure of no inconsiderable proportion of the public and private revenues of this country; on this ground alone it is surely

desirable that both public bodies and private individuals should have some distinct ideas on the matter. But there is a higher reason than this for inviting a little attention to the subject.

Architecture differs from other arts in this, that its productions are not, except in a legal sense, private property. A bad volume of poetry soon dies a natural death; a bad picture may be laid out of sight, or at most is not necessarily obtruded upon others than the owner. But a large building is so such innocuous creation. It can neither be laid up in a garret nor even "reviewed" out of existence. Once built, there it stands, an accomplished and stubborn fact; cutting off from us a certain proportion of light and air and blue sky, for which, as Mr. Ruskin says, "It is bound to give us something in return." It may exist as an expressive, picturesque object; an evidence of thought and originality in the selection, collocation, and decorative treatment of materials; a friend whose aspect, changing with the changing seasons, becomes interwoven inseparably with our daily associations, and is hailed with delight after a long absence; or it may be, as too often happens, a shadow upon our daily life, a grim mass of lifeless stone or brick, oppressing us with its tedious and persistent gloom, or a great fantastic, meaningless jumble of angles, and points, and chimneys, exercising on us a constant irritating influence, not the less real and annoying because its source may not always be distinctly traceable. But which of these aspects our collective buildings shall assume—how far we may extract anything of pleasure or grace out of the multitudinous erections which the needs of our crowded modern life call into existence—depends not alone, or even in chief part, on the body of persons called architects, but in a very great measure on the amount of feeling for and knowledge of the subject, and the degree of importance attached to it, by those who employ (or who do not employ) the aid of the professional designer. In architecture, as in most other matters, the law of supply and demand operates largely; and so long as the art of architecture, in the real sense of the word, is a subject entirely ignored even in the most liberal of our educational programmes, and either slighted or misunderstood by the public and the press generally, so long is there little probability that what is so lightly valued should be forthcoming, or that any of the best heads among us will give their thoughts to a profession so little likely to afford them any worthy occupation or recognition.

What, then, is architecture? At the commencement of this century, the answer would have been that the art of architecture lay in the employment of certain patterns of columns and capitals, each with its appropriate base and superstructure, known as the "five orders," the precise proportions of which, in all their parts, were indubitably fixed by able theorists, as well as by measurement from Greek and Roman examples, and were as the law of the Medes and Persians, which altereth not. The application of these features to the exterior of a building, without reference to its internal arrangement or objects, constituted it a work of architecture: "very fine for a Greek god," as the late Lord Dudley (he of the *Quarterly*) said, on seeing the drawings for his new house, "but a modern gentleman must have offices." In general, however, the wealthy amateurs stood by the five orders very consistently; there is, indeed, a story that a gentleman of the period, seeing one of these sacred features treated with unbecoming license under the hands of

that very great master who found us all brick, and left us all plaster, in Regent's-quadrant and elsewhere, took on him to interpose, inquiring of the foreman "what order he called that?" and was brought up with the reply, "It's Mr. Nash's positive order, sir." Of late years positive orders have taken another turn, and everything must be an imitation of some feature of Mediæval architecture, even down to the grotesque heads of devils and other monstrosities, which were a natural outbreak of the half-savage humour of the Middle Ages, but which glare at us from our new churches and town-halls with an absurd incongruity of sentiment. At the present moment very few of the leading architects of England or France entertain this view of their profession, as the art of copying; even those in this country who sanction it by their practice seldom defend it in theory. But the idea has become so rooted in the minds of a large proportion of the public, that it is often impossible to satisfy people with a design until they are assured on reliable evidence that it resembles, not only in general aspect, but in the treatment of all its details, something that has been done some hundred years ago; and therefore it is necessary to state, most emphatically, that "architecture" is not "archæology," that the two things are perfectly distinct, and that the reading

of books giving an account of the various periods of Gothic architecture, which is so fashionable with certain people just now, no more constitutes a study of the art of architecture than reading a history of Italian painters and their works constitutes a study of the art of painting.

Architecture is simply the art of building with constructive and decorative expression. It consists mainly in so arranging and grouping the principal portions of a structure as to form an agreeable and well-balanced outline or composition of a definite and consistent character; in so emphasising and marking the main constructive portions of the building as to increase its apparent stability to the eye, and to render its external aspect expressive of its internal purpose, arrangement, and construction, instead of being a mere dull and lifeless screen or protection from the weather; and lastly (though this is the least important branch of the art), in applying suitable and expressive decoration to enliven those other portions of the structure which, unless relieved in such a manner, might appear too dull and monotonous to the eye. The reader will be kind enough to notice the order in which these three requirements of an architectural building are named, which is in accordance with their relative importance and priority of consideration. Let it be remembered that architecture is essentially based upon practical and constructional necessities, and that a building is architecturally truthful only so long as it shows itself as a *bonâ fide* endeavour to meet and to illustrate the requirements of its special case. Consequently the *plan* is always the first consideration, and upon or along with its general distribution arises the general composition of the design, the question of what form and what relative position the leading feature (tower, dome, or whatever it be) should take, so as to emphasise and call attention to the central point of the plan, and indicate the internal arrangement of the building. In a similar manner the general construction of the building and the provision for light, ingress and egress, ventilation, and such requirements, become a part of the design. If, for example, our edifice be a lofty apartment in one height, we treat it accordingly, with lofty windows, and with a generally vertical predominance of line; if, as in a mansion, we have one floor over another, this becomes the *motif* for the division of the design into corresponding stages, marked externally by horizontal mouldings ("string-courses," as they are technically termed). We must have openings in the wall for light; we surround these with mouldings, or crown them with canopies as a weather screen. It is essential that our walls have a firm and solid base. By the thickening-out of the walls near the ground we get the base-course or "plinth," giving both a real and apparent stability, which we may still further emphasise by multiplying the lines and mouldings which mark and define this additional thickness. Wherever there is a sloping roof (which in this climate is nearly always), it is an essential of really good building that the roof overhang the walls, so as to throw off the wet from the latter. We introduce mouldings to break the abruptness of the angle of roof and wall, and so we have the origin of the "cornice," which is nothing but the projection of the roof artistically treated. On the important effect of the mechanical structure of the building upon its style of design, we shall have occasion to touch farther on; but even the above brief summary of some of the relations between practical requirements and architectural design may serve to indicate how absurd it is for any one to set about building, as many do, with the intent to imitate some previous architectural model and adapt their practical requirements thereto; thus exactly reversing the common sense and logical method of procedure, besides incurring the risk of other inconsistencies, both practical and æsthetic, which we shall have to allude to. Our third step in design, decorative detail, is the only one which can be called arbitrary in its application. We may almost entirely dispense with it, and still have a very fine and expressive building as in some of the finest Early Gothic work of France and England, or we may carry it to the highest degree of elaboration, provided that we do not obscure or weaken the constructive design; provided also (which is a very important principle) that the ornament is confined to the decoration of features which already form a portion of the main design, and play an obvious part in the building. Architectural truth of design is violated whenever a feature is introduced purely as an ornament; it then becomes an excrescence. This principle, to which we shall again refer, has received practical illustration in all the most admirable monuments of architectural style which remain to us. This restriction, however, does not apply to sculpture of a high class and possessing artistic interest of its own; such work

* From *Fraser's Magazine*.

passes out of the domain of architectural ornament, and is to be viewed as a separate art in itself; and the recognition of this distinction between sculpture and mere ornament leads us naturally to the most important and interesting consideration with reference to the theory of architectural design, but the most difficult to render intelligible to those who have not specially studied the subject—viz., the nature and degree of expression which architecture as an art is capable of, and the difference of principle lying between that and sculptural or picturesque expression.

The nature of this distinction is broadly indicated in the first of the two quotations placed at the head of this essay. Architecture, it is assumed by Eastlake, can only imitate the *principles* of Nature. Such a limitation, it is evident, places it at once on ground quite distinct from that occupied by what are sometimes called "plastic arts." Not only do sculpture and painting possess, as we all know, the power of imitating the outward forms of Nature, but this imitation is almost a *sine quâ non* towards the realisation of the special objects. They influence our minds either through the mere reproduction of scenes or objects in Nature, which possess beauty or interest for us, or (in their higher efforts) by using such forms or aspects as the vehicles for the expression of the artist's own feelings and imagination, or of his reading or translation of historical or imaginary scenes. Architecture has no such power of reproducing or depicting the facts and forms of Nature, or of making use of these for the expression of definite facts or ideas. As an art it is removed farther back, so to speak, from the plane of intellectual vision; its references to Nature are metaphysical and abstract rather than physical and concrete; and it seeks not, like painting, the distinctions and *differentia* of natural objects, but their affinities and points of resemblance, whereon to found its own general principles. In variety, vividness, and intensity of expression and of human interest, architecture can never compete with sculpture and painting; but its lack of definite expression is compensated for by a proportionate degree of breadth and universality. In all true and consistent architectural styles, whatever their diversities of construction and aspect, the same fundamental laws will be found illustrated, and the same adoption of the principles rather than the forms of Nature; the resemblance to Nature appearing most purely metaphysical when we contemplate a style or a representative building as a whole, and approaching more nearly towards physical imitation in proportion as we direct our attention to details. This will, perhaps, be rendered more clear by a brief reference to the characteristics of the two most perfect and consistent styles of which we have any record—the Doric Greek and the Early English Gothic.

Looking at any of the typical structures of these two styles, we recognise in them certain broad characteristics which are common to every production which can claim the title of architecture. Such are *symmetry*, or balance of parts, and *rhythm*, or regular recurrence of features and divisions of equal proportions; properties which, however exemplified, we know and feel to be by a law of our nature pleasing to us, though we cannot define or comprehend the origin and *rationale* of such pleasure. So also the necessity, instinctively felt and universally responded to in architecture, for a solid basis to the superstructure, and a crowning member to complete the composition, is one of those deep-seated principles which underlie not only architecture, but music and poetry also; and is based on considerations common to all these arts. When we look more into detail, we become cognisant of those special qualities which distinguish good architecture from bad, and afford more definite and marked examples of the imitation of natural principles. Take, for instance, the most perfect and consistent architectural feature, probably, that has ever been invented—the Doric column. This is a feature intended for the support of a superincumbent weight acting vertically upon it. A plain cylindrical post, with a square block or abacus at the top to distribute the pressure a little more, would have answered the purpose practically. But this was not enough: the column must indicate its properties and office; and every part of it is designed with the view of expressing power to sustain vertical pressure. Its bounding lines are slightly convex, giving greater apparent strength and substance than a perfectly straight line would have insured. Its appearance of rigidity is intensified by the hard sharp vertical lines formed by the edges of the "fluting," which, converging together at the top, are there bound round by the necking or "astragal," above which the column expands into the broad shallow curved moulding supporting the square "abacus," which, in turn, forms the seat for the superstructure.

We cannot say exactly why this peculiar treatment should have the aspect of strength and fitness for sustaining weight, but we may see that the same general treatment is followed in Nature. In the case of a man's hand and arm resisting a pressure vertical to it, we find the same characteristics—the slight curve of swell in the outline, the tapering and binding together of the muscles at the wrist (the "necking" being emphatically the *wrist* of the column), the subsequent expansion beyond this point into the flat surface of the hand prepared to meet the opposing surface—are all the counterparts of the columnar design; which, while avoiding the slightest hint of imitation of form, reproduces most faithfully the principle of the natural feature. We do not assert that the designer of the Doric column had such imitation absolutely in view; whether he had or not is nothing to the purpose; the fact remains that, in working out the most successful of all architectural features, he followed, whether consciously or unconsciously, the same principles as are exhibited in Nature, while strictly preserving the rigidity and symmetry of form essential to the durability and stability of expression required by architecture. As we descend to minuter and more strictly ornamental details, we find that we may safely approach a grade nearer to natural form without losing architectural expression. Thus the well-known Greek "honeysuckle" ornament, as it is called, approaches in form very nearly to something like a real product of vegetation. It is, nevertheless, no imitation of any flower; but it is an imitation of that principle of growth from a central stem which is common to nearly all flowers, treated with that stiffness of line and absolute symmetry of parts which are required to bring it into harmony with an architectural design. If we turn from the Parthenon to a Gothic cathedral, we find a similar imitation of natural principles, though in a somewhat different direction. The Greek architect recognised *weight* in his design, and even emphasised it. The Medieval architect, piling up buildings of far greater real massiveness, would fain eliminate altogether the appearance of weight, without concealing structure; and so there arose in time, and after multiplied experiments, those structures which are the admiration even of those who do not appreciate the constructive and artistic problems grappled with, where the weight and mass of the supporting piers is made to put on a face of airy grace and lightness, from which the vaulted ceiling appears to spring in a natural and inevitable outgrowth. And how is this lightness mainly achieved? In reply, we have but to observe that, in Nature, it is only stems which have little or no weight to support that can arise straight, slender, and upright for their full height. The conditions are the same, the order only of our reasoning is reversed: the flower-stems are tall and slender because they have no weight to support; the Gothic vaulting-shaft appears to have no weight to carry because it is tall and slender in proportion; the lines of the vaulting carry out the same principle of lightness, the vaulting-ribs appearing to spring from, rather than to rest upon, the heads of the shafts, and by their thin lines, falling over in a curve to the centre, calling away the eye from the contemplation of the masses of stone between them, and cheating it into the belief that there is really no weight at all to be carried. So that here, simply by the method of treating the surface of the masonry—of so moulding and fashioning it as to suggest and emphasise the idea of verticality and upward tendency, the Medieval architect was able to remove from what was in reality a collocation of ponderous masses of stone all idea of downward weight and pressure, and to represent his building as a growth from the ground, on natural principles, though without any imitation whatever of natural objects. The Gothic vaulting rib is perhaps one of the most remarkably successful instances of architectural expression, since it increases both the apparent strength and lightness of the stone ceiling; for, could we pare off the mouldings which form the vaulting-rib, and leave only the bare line formed by the intersection of the different planes of the vaulting, the latter would positively appear heavier through this actual loss of material, because the attention would then be directed only to the broad masses of the masonry, instead of being concentrated on the comparatively narrow lines of the moulded rib. The imitation of principle rather than form is again to be seen in the ornamental detail of Gothic as of Greek architecture; with the difference that the former style comes altogether somewhat nearer to Nature than the latter; a nearer approach being made to natural forms in some of the larger features of Gothic architecture than was permitted in any but the smaller decorative details of Greek; and thus we find Early Gothic ornament approaching so near to natural form as to throw aside symmetry, and exhibit, in the carving of capitals, &c., much of

the freedom and irregularity of Nature. But even here the instinct of the early Medieval architects kept them clear of mere imitation of form; and the Early Gothic carving (the superior beauty of which is now universally recognised) has its own forms and its own conventional stiffness of treatment: purely architectural, it imitates the principle of irregularity of growth, but not the growth itself. It was only in the rich and fascinating decadence of the style that the architectural carver forgot his true office, and attempted a literal translation into stone of the delicate crisp forms of natural vegetation, as in the latter Gothic capitals, when the foliated ornament no longer appears as part of the architectonic growth of the structure, but as a mere application of imitative carving, in a material too coarse and granular to give any but an imperfect reudring of the fibrous delicacy of Nature; the effort resulting in *tours de force* of execution beautiful in their way, but which have lost all that metaphysical beauty and fitness of expression which rendered the earlier Gothic ornament so satisfactory to the judgment.

We alluded just now to the effect of mechanical structure on style and expression in architectural design. Without troubling our readers with questions of practical construction, a word must be said in illustration of the general relation of the principles of construction to those of design; the latter being, in all true styles, the outward expression of the former. We may still go for our illustration to the two styles already alluded to; for Greek and Gothic architecture represent respectively, in the purest and most unmixed form, the two main divisions of construction in architecture—viz., the *trabeated*, or (as the word implies) that in which openings or apartments are roofed by a beam or lintel (*trabes*) laid from wall to wall; and the *arcuated*, in which the arch alone is used for roofs and window-heads, &c. One important practical distinction between these two typical modes of construction will be perceived at once. A lintel construction is limited in the size of its openings and apartments by the cohesive strength of the material used as a lintel, and the lengths in which it can be made available: for example, we cannot procure stones in one block of more than a certain length, and consequently our walls or columns cannot be farther apart than the greatest distance across which the stone lintel will carry. There is no such limit in arch construction; the arch consisting in the collocation of separate stones in such a way that by their mutual pressure they shall uphold each other, all superincumbent vertical weight being transmitted laterally through the arch stones or *voussoirs* (as they are termed) to the base or abutment on each side from which the arch springs; and, so long as this abutment is immovable, almost any space may be bridged, and nothing but absolute crushing of the materials can cause the fall of an arch. But a still more important distinction, in its influence on architectural design, is that between the manner and direction in which the weight of the superstructure operates on the supports. A moment's reflection will render it evident that in a building of the beam or lintel construction, the whole of the weight of the superstructure operates by a directly vertical pressure on the walls or columns, and that the latter are mechanically independent of each other; we might remove all the building except two columns and the lintel across them, and the stability of the portion left would remain theoretically unaltered. An arched building is in a totally different case. It stands entirely by the balancing of one pressure against another. Each arch exercises a lateral pressure against its abutments, tending to thrust them outwards; a pressure which must be counteracted either by a massive abutment or by a counter thrust from an adjoining arch. Thus, in the long arcades of our cathedrals, the arches are all balanced against each other; and were the end "bay" removed, there is nothing but the adhesion of the mortar to prevent all the rest following suit. Now, look at the effect of these constructional principles on architectural design. In the Doric temple, the perfection of the trabeated style, every feature is expressive of vertical pressure; the heavy horizontal lines of the lintel or "entablature" have no lateral sway or tendency; the column is, as we have pointed out, the perfect expression of resistance to weight acting in the line of its axis. When the Romans, who were great engineers, but bad artists, came to deal with architecture, they introduced the arch in their constructions, but with no corresponding change in the principle of external design. They could only borrow the features of Greek architecture; they applied (or misapplied) the column and capital to the exterior of their buildings, either as a mere decoration independent of the construction,

or they used it to thicken and strengthen the wall at the points where the thrust of the vault impinged, thus using, for resistance to lateral thrust, a feature whose every line told only of resistance to vertical pressure. As long as there was such a contradiction between internal structure and external design, there could be no true architecture. It was only when, about the tenth century, the idea of the *buttress* was struck out, that the arcuated style found its natural and consistent expression. The Romans, who in their earlier arched buildings had used what is termed a "waggon-vault"—i.e., a continuous arched ceiling running the whole length of the apartment, and requiring a continuous and uniform thickness of wall to form an abutment for it—had subsequently given the hint of what was afterwards expanded into the Gothic vault, the principle of employing cross arches obliquely so as to collect all the thrust of the vault on to detached points in the external wall. At these points were placed the buttresses of the Mediæval builders; masses of masonry projecting at right angles from the main wall (which, between these points, was a mere screen), and receiving the collected thrust of the vaulting ribs; while their form and outline, sloping gradually away from the top to the bottom, and spreading furthest at the ground level, exactly expressed their use and office, as abutments or counterforts leaning towards the building and counteracting the outward thrust of the arched vault. Thus consistency of expression was restored to architecture, which forthwith blossomed abundantly into those marvellous productions of Mediæval masonry which the most ignorant admire, and which have been regarded by rhapsodical *dilettanti* as springing from the desire to reproduce in stone the splendour of forest scenery, but in which, grand and romantic as their total effect is, all the main features can be traced back, step by step, to their purely mechanical and constructive origin.

(To be continued.)

GOSSIP FROM GLASGOW.

"IN such a night as this," as Lorenzo says in the play, the first thing that naturally suggests itself is bath—a swim in that Loch Ketturin which the genius of Mr. Bateman has made more "familiar in our mouths" than has even that of Sir Walter Scott. Yet, strange to say, although we are never tired of boasting that from the far distant lake of Roderick Dhu and Ellen Douglas, we enjoy the best water supply of any city in the world, cheap, convenient, and comfortable bathing is still almost as far removed from Glasgow as is the scene of Scott's poem. In nearly every other respect, this abundant supply has been largely taken advantage of. It fills alike the factory boiler and the domestic kettle, flashes our sewers, waters our streets, and washes out our alleys. Fire-plugs are now more plentiful than lamp-posts, and swan-necks are in even the Goose-dubs.* But of public baths—in a large industrial community like ours, almost a public necessity—we have nothing worthy of the name. Towards the removal of this reproach among the first efforts is an adventure in the upper stratum of society—"the Glasgow Swimming-bath Company," and for which handsome premises are to be opened on the 1st of August. The cost of the building will be about £2,300; the shares are £5 each; the annual subscription for those who are shareholders before the opening-day is 30s., and for others, 40s., with 20s. of entry-money. The bath measures 70ft. by 35ft.; slopes from south to north, its depth at the northern side being 7ft. 3in., and at the southern, between 2ft. and 3ft.; and the height from the water-level to the wall-head of building is 27ft. 6in. The sides and floor of the bath are lined with white glazed bricks, jointed with red cement, and along the upper edge of the sides is a border of two lines of black. Along the north and south walls are ranged the dressing-boxes, and to within a few inches of the water are suspended from the roof trapezes, swings, iron rings, ladders, and various other gymnastic "means and appliances." Besides the swimming there are Turkish and hot baths, and a smoking-room 24ft. by 18ft. 6in. Little more need be said than that the building is alike most handsome and comfortable; that the architect is Mr. Burnet; that the style of architecture is Italian, slightly flavoured with Greek; and that when once "the wealthy curled darlings" of our city are fairly afloat, it is to be hoped that the "unwashed artificer" will shortly follow.

A statue (by Brodie, of Edinburgh) of John Graham-Gilbert, the late eminent portrait painter, is about to be erected in the MacLellan Galleries. As a colourist, Graham-Gilbert was, perhaps, without a

contemporaneous rival; he had, however, one fault—perhaps rather misfortune—he was wealthy, hence did not need to paint, and consequently his fame is not so widely spread as it should be. The statue is a gift to the city by his widow.

Some time ago I made mention of an admirable scheme for the accommodating of all the municipal offices under the one roof of a magnificent building designed for George-square. That scheme was abandoned; but, as the offices must be accommodated somewhere, it is now resolved that they, and chambers for the Sheriffs and Justices of the Peace, be added to what are called the County-buildings—a large and imposing architectural group, with frontages towards Wilson, Hutcheson, and Brunswick streets. The extension will be along Hutcheson-street on the west, and Brunswick-street on the east, to Ingram-street on the north—now, since its continuation *via* Canon-street to High-street, very likely to be a thoroughfare. It will cover an area of upwards of 4,000 square yards; £12,000 is about the price of the ground, and £30,000 is an estimate of the building. The style of the present buildings (Greek) will be adhered to. A prominent feature in the principal front, which is to be towards Ingram-street, will be a Corinthian colonnade. The architects are Messrs. Clarke and Bell, who have been judiciously chosen for what may be said to be at once the continuation and the completion of their original design.

An intermedial addition to the County-buildings is presently in progress, and I regret that there cannot truly be said of it, "So far, so well." One of the best parts of what is an admirable composition throughout is what is called the Merchants' House. It is emphasised by being columnar and projecting beyond the rest. In the addition, the walling is brought so far forward that the projection of the cornice of one of the windows is beyond the terminal pilaster of the Merchants' House (relieved its full depth at the corresponding other end), and, moreover, the position of this window is so close to the pilaster that the cornice has to be "curtailed of its fair proportion"—extending some inches less over the console at the one end than over that at the other. I can imagine only one reason whence architects of the professional status of Messrs. Clarke and Bell might so mar their earliest and still a principal work—pressure may have been put upon them, outline may have had to be sacrificed to tape-line; and architectural harmony could scarcely be expected if, in the first place, two and two were expected to be made five. With some well-meaning people, a square yard of space is worth fully more than the proportions of the Parthenon, and the reputation of a Wren or a Wyckham is as nothing to the "turning to shapes" of some cheese-paring whim or penny-wise crotchets.

At a meeting of the Barony Parochial Board held on the 20th of July, it was decided to build a lunatic asylum in connection with the workhouse. The site for the asylum is some miles distant from that of the workhouse, being near to the Lenzie Junction of the North British Railway. The plan is on the block or pavilion principle, and is designed for 400 inmates, an equal number of male and female. The extreme length of the building will be 800ft., and the greater part of it will be of two stories. There are to be two towers of considerable height, "contrived a double debt to pay," to convey hot and cold water and to provide ventilation. These promise to be important features in the grouping. As the site is high the building will be conspicuous in the landscape, and will be well seen from a considerable distance. The style is Elizabethan, and the architects are Messrs. Salmon, Son, and Ritchie.

Extensive additions from plans by Mr. Forrest Salmon are being made to Glasgow Bridewell, the chief prison of the county. These comprise principally a governor's house and a large increase of cell accommodation.

On the south side of the river large and handsome premises are about to be built for a branch office of the British Linen Banking Company. Messrs. Salmon, Son, and Ritchie are the architects.

A building of sufficient conjunct halls has long been a public want, which an influential movement is now seeking to supply. These halls can be public only by being in a public place—certainly not too far north-west, where the population if wealthiest is also sparsest. Experience has shown that public halls are principally supported by not the wealthy but the middle and humbler degrees of the social circle. There are a hundred soirées for one banquet.

Business is brisk in the neighbourhood of Buchanan-street. On one side of St. Vincent-place old buildings are being taken down to give place for

the Clydesdale Bank, and directly opposite tradesmen are no less actively employed in clearing the site for offices for the Scottish Amicable Assurance Company; while on the other side of Buchanan-street, and within a stone-throw, an addition to the Western Club-house is waiting impatiently for the last cart of *debris* to be wheeled off the ground.

Notwithstanding that the foundation-stone of the "Albert" bridge was laid with so much ceremonial, the bridge itself was opened with so very little—an advertisement and a paragraph in the newspapers—that I think it can scarcely be an offence if I have passed it over in my communications to your columns. The bridge is of three arches, the one immediately below it is of five, and that further down the river is of seven, and just in proportion as the engineering science becomes greater the architectural art becomes less. Than the Jamaica-street bridge a more beautiful structure of the kind can scarcely be—like graceful in its composition and ripe in its detail; the detail of the "Albert" bridge is commonly commonplace and occasionally inappropriate. But carving and gilding stand in good stead with the public. It was expected that the gradient of the bridge would have been such as would have helped the elevation of the jail, but the grand Greek façade may be said to have still, as Canning sang of the Marquis of Anglesey, at least one foot in the grave.

So far as has been made known by the newspapers, there is to be no public celebration of the Scott Centenary, with the solitary exception of a social meeting in the East End. At the Theatre Royal, "early in August," a newly-dramatised version of "The Lady of the Lake" is to be put upon the stage, when Ellen, "pushing her light shallop from the shore," will have real Loch Ketturin water to float it on—a stage property that could not be set upon any other boards in the empire!

SOCIETY OF ANTIQUARIES

A MEETING of the members of this society was held on Friday in the Chapter-house, Westminster, by the permission of her Majesty's Government, under the presidency of the Very Rev. the Dean of Westminster (a vice-president of the society). There were also present the Right Hon. W. E. Gladstone, the Right Hon. W. Cowper-Temple, M.P., and Sir W. Tite, M.P.

The CHAIRMAN, in opening the proceedings, alluded to the state in which the building was when the society formerly held a meeting therein, seven years ago, before the restoration was determined on. Since that time, with the assistance afforded them by Government, they had brought it to its present state. The windows were restored from one which was left in a good state of preservation; the beautiful floor disclosed itself as soon as the boards with which it had been covered were removed, and the frescoes on the walls were found when the bookshelves and books were removed. The centre frescoes were probably of the fourteenth century, and had surmounted the five great seats of state in which the abbot sat, and in one of which no doubt sat the Speaker of the House of Commons during the 300 years that that House sat in the Chapter-house and passed the Mediæval laws. The frescoes which run round the arcade of the whole building were added in the reign of Edward IV., having been painted by a monk, called Brother John, of Northampton. The records of his painting, a series of pictures from the Apocalypse, were still in existence. The other series of frescoes were uncertain, and the abilities of the society might still be usefully employed in endeavouring to ascertain what they were intended to represent. The stone coffins which had been found in the immediate vicinity showed that at one time, like the abbey and cloisters, it had been a great cemetery. The stone coffin which was found immediately outside the Chapel of St. Nicholas, was that of Egelric, Bishop of Durham, who, after undergoing many vicissitudes, was finally buried there, and his memory almost venerated as a saint. He thought that it was meet that the society should be the first to assemble within the reconstructed building, inasmuch as it had been the means of enabling the present generation—the first for three hundred years—to see the Chapter-house as it was in the time of the Plantagenets. They could hardly say, however, that the restoration had been carried to that state of perfection to which they hoped it would some day attain, and he thought there were two points upon which the society might still render to the building the same kind of service which they had already done so successfully. The first was that they could not rest satisfied until the windows were filled with stained glass, as was the case originally; and the second was the desirability of

* One of the meanest parts of the city.

erecting a cloister, which would fulfil the purpose of a *campo santo*, where the illustrious dead of the future ages might be buried. A site contiguous could be used for that purpose. When those matters were carried out it would complete the work, the completion of the first portion of which they had met to inaugurate.

Mr. G. G. SCOTT then explained the architectural difficulties which had been dealt with, and the mode in which they had been overcome in the process of reconstruction.

Mr. R. NEVILLE-GRENVILLE proposed, "That this meeting, while particularly congratulating her Majesty's Government upon the progress so judiciously made in restoring the Chapter-house, anxiously desires to impress upon the Government and both Houses of Parliament the necessity of completing the task they have taken in hand by filling the windows with stained glass."

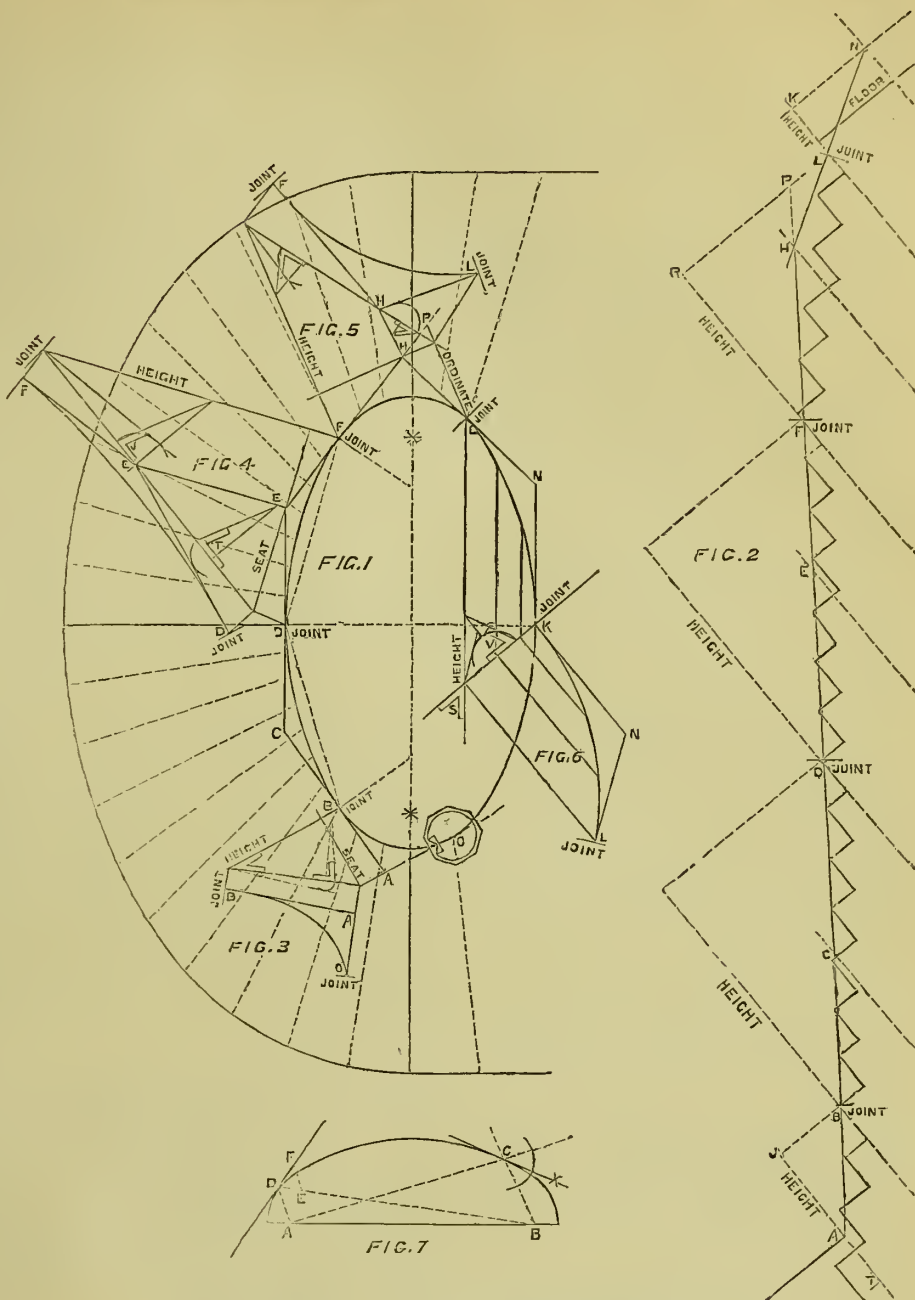
Sir F. POLLOCK, Bart., seconded the motion, which was adopted *nem. con.* Addresses were also delivered by the Right Hon. W. Cowper-Temple, Sir W. Tite, and Messrs. J. H. Parker and H. Reeve, and formal resolutions, suggesting to the Government the formation of a cloister for fulfilling the purposes of a *campo santo*; thanking Mr. Gladstone for granting permission to assemble in the Chapter-house, and to the chairman for presiding over the meeting, were carried amid cheers, and the proceedings then terminated.

BUILDERS' BENEVOLENT INSTITUTION.

THE twenty-fourth annual meeting of the subscribers and friends to this charity was held on Thursday afternoon at Willis's Rooms, Mr. Alfred J. Mansfield, the President of the Institution, being in the chair. The report, read by Mr. A. G. Harris, the Secretary, stated that the funds of the Institution remained in much the same state as heretofore. The first election of pensioners took place in November, 1870, when one man and one woman were elected to the benefits of the Institution; and the second in May, when a similar number were chosen. In addition to this, three of the widows of deceased members—Mrs. Budd, Mrs. Hambrook, and Mrs. Lambert—were, in accordance with the rules, receiving the widows' pension to which they had been respectively entitled, by election, from the time of their husbands' deaths. At the close of the last election, Mr. J. Waldram (of the firm of Hill, Keddell, and Waldram) presented a cheque for £12 12s., to be divided between the unsuccessful candidates highest on the list of votes. The names of the pensioners elected in November, 1870, were Mr. B. Johnson and Mrs. M. Morgan; in May, 1871, Mr. Wm. Peters and Mrs. H. Proctor. The names of the pensioners who had died since the last report were Messrs. H. Budd, S. M. Hambrook, and Mrs. Garrod. The addition to the funded property of the institution in Three per Cent. Consols during the year was £313 8s. 8d.; £214 9s. 5d. stock for the relief fund, and £98 19s. 3d. for the building fund; making a total of £15,389 3s. 7d.; £12,137 15s. 1d. for the relief fund, and £3,251 8s. 6d. for the building fund. The report concluded with an earnest appeal to the committee and friends not to relax their endeavours in supporting an institution which had conferred on the helpless and necessitous members of the building trade such incalculable benefits. The Secretary next read the balance-sheet, which showed the receipts to have been £2,251 15s. 4d., and the expenditure to have left a balance at the bankers' of £425 13s. 3d. The report and statement of accounts having been adopted, votes of thanks were passed to the patrons of the Institution, the president, vice-presidents, the trustees, directors, the treasurer, to Mr. Joseph Bird for his services at the last ball, to the auditors, and the honorary solicitors. Mr. Bird mentioned that the Tile and Brickmakers' Society were prepared to place some of the accommodation afforded in their almshouses at Ball's Pond at the disposal of the Builders' Institution for the use of some of their pensioners, if the directors were prepared to accept the offer. The matter was reserved for the consideration of the Board.

A vote of thanks to the chairman closed the meeting.

A new company, with limited liabilities, styled the Kamsone Patent Stone Company, is now being formed for the purchase and working of the patents. A well-selected board of directors has been formed, of which Mr. Henry Bessemer (whose name is so well known in connection with various branches of science) is the chairman. The capital of the new company is only £25,000, nearly the whole of which has already been privately subscribed.



NEW ELEMENTS OF HAND-RAILING.—PLATE XXXIX.

NEW ELEMENTS OF HAND-RAILING.*

(Continued from page 56.)

PLATE 39.—CONSTRUCTION OF WREATHS FOR ELLIPTICAL STAIRS.

FIGURE 1 exhibits the ground plan of stairs. The centre line of rail given.

The moulds must be produced by ordinates. Not that it is impossible to strike them with a trammel; for, undoubtedly, the curves on wreaths are elliptical; but, to find the centres and diameters of these curves would make the drawing both intricate and complicated, causing unnecessary loss of time, to no particular purpose.

The best method to adopt for stairs of this description is to lay down the centre line of rail, and set off half of its width on each side. Then fix upon position of joints, say B, D, F, L, and K, on landing.

This arrangement makes the piece of wreath that stands over D F answer for D B. It being reversed, the joint B and that of F are at equal distance from D. Again, the angle of tangents at both places being exactly alike makes the ordinate a right angle with chord D F. That is, provided the position of wreath runs on a straight line from B to F. The wreath starting from newel, one of its tangents must be level.

This, in all cases, is the ordinate.

The same remark applies to the wreath landing. Its ordinate being K N. The heights of wreaths

and construction of moulds are obtained, as usual, by unfolding tangents and winders. These are shown on the right.

The letters on pitches agree with those on the plan.

The whole construction is similar to that which has already been given for circular and other stairs. Therefore a detailed explanation of this plate will not be required.

It was thought best to omit the width of moulds in order that the drawing might be more easily understood.

The tangents on the moulds and the bevels being the most important points, these are obtained and applied in the same manner as those of circular stairs.

We will now notice the heights:

That for the first piece of wreath, starting from newel, is A J, which agrees with that of Fig. 3 on the left, and the lines A B, at both places, are of equal length; and thus the mould is proved correct.

Fig. 4 shows the tangents and bevels for mould, which answer for two pieces of wreath from joint B to F.

Its height agrees with that shown over B or D on the right.

Bevel T applies to joint D, and bevel J to joint F.

Fig. 5. The ordinate for this mould is obtained by extending tangent F H.

Let F P equal R P on the right. Join L P, the ordinate. Let the line marked "Height" equal that of R F on the right. Bevel H applies to joint L; and the bevel on the left to joint F.

Tangents on the mould, to be correct, must equal

* This series of articles is a reproduction of ROBERT RIDGELL'S work on the subject, published in Philadelphia, and by Trübner and Co., London.

itches on the right. Letters at both places correspond.

Fig. 6. This mould being for piece of wreath landing, its tangent and ordinate is N K. The height equals that of L K on the right. Tangent L N, to be correct, must equal pitch L N on right.

It will be readily perceived that the whole of this process is a repetition of the methods which have already been adopted for producing moulds and bevells. The only difference is the curves, which must be obtained by ordinates.

There are one or two other points that it may be well to mention. First: There can be no question or doubt as to the chaste and beautiful effect of elliptical stairs; to execute which both skill and judgment are required: And more especially in the height of rail, which is a most important point.

Let any one notice the hand-rail of an elliptic stairs, and stand on winder B. Here we find the rail too low. Why is this—the baluster is the same length as that at D, and yet there is a great variation in the height of rail?

The cause of this is owing to the position of the winders and tangents, which is fixed and unalterable.

Observe tangent through B. It and the winders do not stand at anything like a right angle. The risers are thrown forward toward the newel, and approach us more rapidly, when going up the stairs, than those at D, where the tangent and winders are nearer a right angle, and where the rail is a proper height.

But go on a little farther, and stand on winder F. Here we find the rail too high, for the reason that the winders are receding from us, and the pitch of rail at this point is much greater than it is at D.

Notice mould, Fig. 4. The tangent E F, being shorter than E D, shows that the wreath stands on two different pitches, yet is parallel with the nosings when in position.

Nearly all elliptical stairs are executed in this manner, and the defects just named may be detected by any one. Then the question arises, How can these objectionable features be removed? or, what means should be adopted to equalise the height of rail to suit the winders?

Let us, for a moment, examine the tangents on the plan.

Take, for example, that of C E. It must be a straight line on the pitch, because there is a joint at D which is stationary and fixed. But C may be raised and E lowered. This at once changes the pitches of rail, and, of course, the height of balusters at B and T.

This simple remedy counteracts the evil, and throws the rail into a proper position, to suit the hand going up or down the stairs.

The next consideration is the bending of wall and front strings. These are usually bent over a cylinder or form; a method both tedious and expensive.

Let kerfing be adopted, and the work is done in half the time; besides being a much better job. The only difficulty is the plan, it being a perfect ellipse, which makes kerfing impracticable. Then change the plan to a figure that will nearly resemble the ellipse. This can be done from centres of unequal radius, thus making kerfing entirely practical for the strings. This point, however, will be more fully explained in the following plate.

Fig. 7 shows two methods for tangents to elliptic curves.

From A and B draw the foci A D and B C. Join B and D, and A C. Bisect the angle on the right, and through the intersection draw the tangent.

Second method, on the left. Take any point, say E, and draw E F parallel with A D. Make E F equal to A D; and draw the tangent.

THE ELECTRIC LIGHT.

THE light produced from a powerful current of electricity, under favourable circumstances, is, says the *Scientific American*, the most brilliant ever yet discovered by man. By actual experiment it has been shown to possess an intensity equal to one third of that of sunlight. The light emanating from an incandescent piece of lime under the action of the oxy-hydrogen jet, well known as the Drummond light, cannot compare with it in brilliancy, nor compete with it in point of economy. Though the first cost in the preparation of an electric light may exceed that of the Drummond light, the subsequent outlay is much less.

The light is produced by passing an electrical current between two pieces of charcoal a small distance apart, one connected with the positive pole, the other with the negative pole of a galvanic battery. In order to keep these burning charcoal points at such a distance from each other as to produce the most

brilliant light, ingenious machines called "regulators" are used. The principle in the construction of these machines is, that the nearer the charcoal points are to each other, so much greater is the flow of electricity. Now, increase in the flow of electricity in the conducting wire will produce corresponding increase of magnetism in an iron bar which it encompasses; therefore, one of the charcoal points is inserted in an iron cylinder, which plays freely up and down in the centre of an electro-magnetic coil. As this coil exerts an attractive influence upon the iron, a weight passing over a pulley is attached to it, which, acting as a counterpoise, keeps it in equilibrium. The other point remains fixed. The result of this arrangement is that an increase of distance between the charcoal points gives a decrease in the flow, and consequently a decrease in the attractive power of the coil. The weight, for this reason, overbalances the attraction of the coil, and the charcoal point is drawn up until the increasing flow of electricity, caused by the decreasing distance between the charcoal points, shall have sufficiently augmented the attractive power of the coil as to restore the equilibrium.

The regulators employed in general use are much more complicated, but their principle is the same.

A machine has been invented in France by means of which this light may be derived from electro-magnetism. It consists of eight rows of powerful horse-shoe magnets arranged around a hollow cylinder, and having their poles towards the axis of the cylinder. The magnets are seven in each row, fifty-six in all, and are attached to a stationary frame. The hollow cylinder has affixed a set of double coils or bobbins 112 in all, so placed that on revolving the cylinder, the ends of the bars, which are the cores of the bobbins, are in rapid succession brought in close proximity to the poles of the magnets, alternately approaching to and receding from them, with great rapidity. This causes a succession of almost instantaneous electrical impulses to be given to the wires coiled around the bars. Connecting this machine with the charcoal points, and revolving it at such a speed as to make the flow almost continuous, for the light only shines while current is passing, a steady light will be produced.

It has been found, by experiment, that if a speed sufficient to give 203 electrical impulses per second be given to the machine, the eye no longer takes cognisance of the intervals, and an uninterrupted light is the result.

A curious example of the correlation of forces is shown in the working of this machine. The cylinder, which is hung in its bearings so delicately that it would seem possible for a child to revolve it with ease, really requires a two-horse-power engine, owing to certain effects produced by the action of the magnets in connection with the coils. This force expended is represented in the light produced; the machine converting force into electricity, and electricity into light; as in the case of the galvanic battery, the force resulting from the decomposition of zinc is the producer of the light.

The uses to which this light may be advantageously applied are numerous. Its peculiar penetrating power renders it unrivalled for lighthouses and signal lights for vessels. Let the darkness be so great that it can "be felt," its light pierces it like a great silvery needle, and falls like a ray of hope upon the seething ocean, which, but for its warning, might have been the watching sailor's grave.

It has been used with success for illuminating mines. During the siege of Paris, the Prussians were much annoyed by one of these lights, which the Parisians had constructed and placed upon Fort Mont Valerien, and which effectively prevented any hostile movement being made by the Prussians under cover of the night.

For stage effect, illuminating halls, streets, or other public places, and for microscopic or magic lantern exhibitions, it may be used.

The application of the electric system for illuminating Bergen Tunnel, through which the Erie Railroad and Delaware and Lackawanna Railroad traverse, we believe could easily be accomplished. Its adoption would relieve the thousands of passengers, who are carried through this tunnel daily, of the apprehension of accident which is irresistible to most persons as they enter the dark and cheerless cavern.

In fact, its uses are so numerous, and its effects so brilliant, that it is a wonder it has not been more universally adopted.

Mr. Short, a builder at Kingswear, aged 60, was drowned on Saturday, while endeavouring to save a young woman who had accidentally fallen into the sea from the rocks near Castle Mount. The young woman was rescued, but Mr. Short's body was not got out of the water until life was extinct.

COMPETITIONS.

BROMLEY, KENT.—The committee appointed for the erection of additional schools in this parish a short time since invited designs from architects in limited competition. The invitation was accepted by Messrs. J. P. St. Aubyn, W. C. Banks, W. Barrett, A. C. Bean, J. Clarke, F.S.A., H. Lovegrove, and G. Truett. One of the designs, marked "Utilitas" (Mr. H. Lovegrove), was generally preferred by the committee, but the estimate was rather in excess of the sum at disposal, and the design of Mr. Banks was selected for execution.

ASHTON-UNDER-LYNE.—The Guardians of the Poor have determined to erect a new female hospital close to the workhouse, and invited five local architects to send in plans. The successful competitors were Messrs. Healey and Hall, Architects, Ashton-under-Lyne. The estimated cost is £4,000.

ARCHÆOLOGICAL.

THE ROYAL ARCHÆOLOGICAL INSTITUTE AT CARDIFF.—On Tuesday the inauguration of this year's meeting of the Royal Archaeological Institute took place at Cardiff, under the presidency of the Marquis of Bute. The historical section was opened on Wednesday by an address from Mr. G. A. Freeman, the President, followed by a paper by Mr. W. Lloyd, on the Conquest of Wales. The members afterwards proceeded to Llandaff to lunch with the Bishop, and subsequently visited the Cathedral under the guidance of Mr. Lloyd.

NEWBATTLE ABBEY.—In the course of some operations which have been going on at Newbattle Abbey, the discovery has been made of what is supposed to be the burial-vault of Mary de Couci, Queen of Alexander II., and mother of Alexander III., who was buried in that abbey about the middle of the thirteenth century. The vault is 5ft. 2in. from the level of the old floor, is 10ft. long by 7ft. wide, and is paved at the bottom. The walls are of polished ashlar, with a bottle-moulded stone stair of eight steps. The moulding is returned down to the top of each step; the two bottom and the top steps are entire; but the middle ones have been taken out at some former period. When discovered, the vault was entirely filled with stone rubbish, and there appeared to have once been a grating over it, as there is an iron bar run in with lead in the face of the top step. The vault lies beneath the floor at the south corner of the crypt, which was originally 93ft. long, with a range of octagonal pillars in the centre running along its whole length. The plain shaft of each pillar, from base to capital, measures 3ft. 6in. From the top of the capital or the spring of the arch is 6ft.; from pillar to foot of corbel, going from east to west, 13ft. 1in.; from pillar to pillar, 9ft. 7in.; and from the keystone of the rib to the floor, 12ft. By the directions of the Marquis of Lothian, the southern portion of the crypt has been in process of restoration for the last six or seven months, under the superintendence of Mr. Bryce, architect, Edinburgh, and his own clerk of works, Mr. Blaikie.

PARLIAMENTARY NOTES.

MR. BARRY, R.A.—Mr. Beresford Hope gave notice on Friday last that he would ask the First Lord of the Treasury whether he had received a letter from Mr. Barry, R.A., praying for inquiry, and whether he would lay on the table the correspondence which had passed respecting the position of the architect of the Houses of Parliament.—Mr. Gladstone, in reply, stated on Monday that he had received a letter from Mr. Barry, and had replied to it, and the correspondence had been published in the newspapers. He saw no necessity for laying it on the table of the House, as it was not strictly a public document.

THE NEW COURTS OF JUSTICE.—Mr. Cavendish Bentinck asked the Chancellor of the Exchequer whether he had approved the architectural designs for the new Courts of Justice now exhibited in the Library.—The Chancellor of the Exchequer could only give the answer he had returned yesterday—that these plans were not yet approved, and were placed in the Library in order to elicit the opinions of members.

PUBLIC HEALTH AND LOCAL GOVERNMENT.—Sir C. B. Adderley obtained leave on Tuesday to bring in a Bill, founded on the Report of the Sanitary Commission, to consolidate and amend the Laws relating to Public Health and Local Government. In explaining it, Sir Charles was interrupted by the customary attempt at a "count-out," and this proving unsuccessful, he went on to point out the complications and anomalies, the expense and inanity of our present system, its conflicting jurisdictions and overlapping areas, &c. The bill, consolidating more than forty statutes, first of all repeals all

existing sanitary statutes. Consequently, out of the 450 clauses of the bill, nearly nine-tenths are intended to re-enact certain portions of them. It simplifies areas, concentrates all authority into one department, and there are also other provisions relating to audit and borrowing powers. As a matter of course, Sir Charles added, it was not intended to proceed further with the bill this Session.

Building Intelligence.

CHURCHES AND CHAPELS.

BREASTON.—S. Michael's, Breaston, in the county of Derby, has just been re-opened. The interior of the edifice has undergone considerable renovation. The architect was Mr. Robert Evans, of Nottingham, and the builder, Mr. Joseph Gill, of Draycott, near Derby.

DONCASTER.—On Thursday week, a new and handsome chapel in Oxford-place, and new day schools in connection therewith—the whole having been built at a cost of £7,500—was opened. The chapel, which has a stone front, and is built in the Italian style, will accommodate 1,000 people; whilst the schools will contain 500 children—boys, girls, and infants. The architect of the new chapel is Mr. W. Watson, of Wakefield, and the builder, Mr. H. Arnold, of Doncaster.

HAMMERSMITH.—The new Church of S. Paul, Masbrough-road, Hammersmith, was consecrated on Tuesday. Accommodation has been provided for 800 persons, at a cost of £5,000. The architect was Mr. Blomfield. The style is Early English, the aisles being separated from the nave by five pointed horseshoe arches supported on pillars with plain capitals. The windows corresponding to the openings are divided into three compartments, separated by mullions perpendicular with the top, where they branch off to cinquefoils. The roofings are ridged, those of the aisles at either side of the nave presenting the appearance from the gables of two smaller triangles flanking a larger. The walls are of yellow brick, relieved with courses of red.

LONDON DIOCESAN CHURCH BUILDING SOCIETY. On Monday afternoon the annual meeting of the members of this society was held at the offices, 21, Regent-street. The report which was presented stated that during the past year the society had been able to continue its work with undiminished success. Its income had to some extent suffered, as had been the case with some similar institutions, in consequence of the heavy demands made upon the public on behalf of the sufferers from the Continental war. The total income of the past year had been £1,198, including a repayment of £80 to the society on a loan granted in former years. The total amount of grants actually paid by the society on account of engagements entered into during previous years had been £1,375, of which sum £1,450 was in aid of the erection of churches, and the remaining £125 towards the purchase or building of parsonages.

READING.—On Tuesday week, services in connection with the opening of a new Primitive Methodist Chapel were held in Cumberland-road, New-town, Reading. The building has been designed by Mr. W. H. Woodman, borough surveyor, and the style will be Gothic, simple, but very effectively treated. The dimensions will be 50ft. long and 32ft. 9in. wide in the clear. Mr. Ponton, of Reading, is the builder. The entire cost is £760.

WHITLESEY.—It is in contemplation to place a suitable reredos in the chancel of S. Mary's church, Whitlesey, which is now especially plain and undecorated. It is to be desired, thinks the local journal, at the same time, that the very ugly blocks of oak, honoured with the name of screen, between the chancel and the nave, should be removed. They are, according to the art critic of the above-mentioned authority, illustrations of the vagaries of genius, and Gilbert Scott never perpetrated a greater blunder than in placing them there.

BUILDINGS.

ASHBOURN.—Mr. Francis Wright, of Osmaston Manor, who has recently erected the church on Low Top, Ashbourn, has engaged Messrs. Crichlow & Ward, builders, of Uttoxeter, to erect a large Market Hall on Low Top, in connection with the new Smithfield. It is intended to be used as an exchange. The architects are Messrs. Stevens & Robinson, of Derby. The building will be in stone, and cost about £1,700.

BIRMINGHAM.—S. Thomas's Parochial Schools, Birmingham, have been rebuilt. The building has two floors, and is Romanesque in style, the chief ornamentation employed being moulded bricks. The

ends and centre of the building are gabled, in order to break the long elevation line. The total cost of the enlargement and rebuilding has been about £1,750. The work has been carried out by Mr. Sylvester Surman, builder, Great Colmore-street, under the superintendence of Mr. Yeoville Thomason, architect, 40, Bennett's-hill.

BRADFORD.—On Saturday the re-opening of S. Jude's Schools, Bradford, was celebrated by a tea party and concert. The building has been raised one story, and many modern improvements added, at a cost of £1,500. The works have been carried out under the directions of Messrs. Milnes and France, architects, who have remodelled the old building in a satisfactory manner.

LEOMINSTER.—On Thursday week, the foundation stone of the new Orphan Homes was laid at Leominster. Messrs. Page and Son, of Leominster, have undertaken the contract for £1,250. The architect is Mr. C. Beale, of Belper, who has assisted in the charitable work by giving his services free of charge.

MANCHESTER.—On Saturday afternoon a new (Roman) Catholic Home for Female Penitents was opened in Victoria Park by the Mayor of Manchester. The building when fully completed will accommodate 200 inmates, but as yet accommodation has only been provided for half that number. It is of domestic Gothic design, and includes a chapel and nunnery, besides the other necessary premises. The cost, without the furniture, will amount to £6,000. The architect is Mr. W. Nicholson, of Manchester; and Mr. Healy, of Salford, is the builder.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

RECEIVED.—J. Jones & Co., T. T. J. J., W. W. W., J. W. T., C. B. A., J. P. S., A. C. J. R., Rule of Thumb, J. B., C. K., W. & A., T. A. M., G. R. J., W. S., C. W. F., S., & Co.

M. H. LINKLATER.—We have no idea of reprinting the "Violet le Due" articles and illustrations.

ECCELOGIST.—Such namby-pamby criticism does no good. You should either adduce more facts, and strike harder blows, or leave what you call "nonconformist architects" alone.

JAS. HICKS.—Drawing returned.

J. C. WILMERFOSS.—"Sketch-book" sent now. It is not our intention to start another.

R. LUND.—We cannot inform you. You say you are a constant subscriber; if that be so, it is rather curious that you should have directed your letter to 166, Fleet-street, an address we left nearly four years since.

WALKER & ATHON.—Drawing to hand. The drawings are rather too dark, by having too much work bestowed on them, to come out well with the photo-litho. process. We will try what we can do with them.

PLUMBER.—In type, but crowded out.

Correspondence.

MODERN DESIGN AND THE ARCHITECTURAL PROFESSION.

SIR,—Architectural improvement, metropolitan and provincial, is a subject of sufficient importance at the present moment to demand the attention of the Legislature and other ruling powers, especially when it is considered that the works we are now undertaking will receive the verdict of other ages besides our own. As the changes we are now making are vast, so in a proportionate degree will our responsibility be increased. What we achieve now in the design of our great national structures will the future historian or philosopher of art look to as a reflex of our thoughts and sentiments and our position in the art history of the world. Diverse and multiform, however, as the architectural picture may appear, it will be in our largest national and civic buildings that the tendency and stamp of our age will be seen.

As the New Law Courts, by Mr. Street, has been commented on by no less an authority than Mr. Fergusson, who may be said to represent the well-informed, practical, and art-learned portion of the nation outside the profession, it may be opportune to notice the opinion of the profession generally. A correspondent of your journal, which has always been a fearless advocate for independent opinions, has raised objections which I think are well grounded. Before the design

is irrevocably committed to brick and stone, it is to be hoped much of it will be modified. There is a miserable want of dignity and harmony in the composition, which I think may be characterised as a heterogeneous mixture of peculiarities, a promiscuous jumble of detail. With all deference to its architect, who has earned a popularity of his own, he has given the nation a more complete repertory of foreign style and detail than well-arranged Courts of Justice. Take the Strand or water front. Here the absence of all rule is painfully manifest. Windows high and low, square-headed, pointed, trefoiled, plain, traceried, following no principle of gradation, seem to vie with one another in their "picturesque irregularity"—recklessly disobeying the first laws of composition. The balance of masses is still worse. Octagonal projections from the main front destroy repose, while the diversity of the roofs—hipped, gabled, and pyramidal, broken in countless portions—gives the idea that the building is rather a collection of some Mediæval fragments than a modern planned structure. But this is not all—the roofs, from the innumerable gutters required, will be a fruitless source of expense and trouble. So much for the exterior. The interior arrangement seems to be quite as inconsistent, for, according to Mr. Fergusson's description, the useless "imperfurate vault," or central hall, seems to be an inconceivable whim, which no beauty of detail or finish can atone for.

Such, then, is the haphazard manner in which a most important national structure has been treated. But the design alluded to is only a representative one of its class. The insane rush for novelty, the disregard and neglect of all principle, is shown in many other buildings lately erected. One would imagine we had lapsed into a barbaric style of building, certainly not one dictated by common-sense, fitness, or beauty. A style adapted to our wants and age can never be attained by pandering to archaeological studies, however interesting in themselves, nor blindly following certain "leaders" of art who have struck out particular paths for themselves. Differences of temperament, differences of thought and sentiment, and various other causes make men think and conceive differently; but if we would advance our art we must weigh these differences by a common standard of truth. The quasi-picturesque style has found a multitude of respectable followers, who, possessing little original thought, gladly avail themselves of a style that lends itself easily to various purposes, and entails no ingenuity and contrivance either in plan or construction. English Gothic is neglected for this more easily-managed because unscientific style of building, to which the Continental and Southern examples of Mediæval art chiefly contribute. It is a manner of building, moreover, which seems to ignore all proportion or harmony of parts, crudities taking the place of well-studied detail.

It is well that there are still some among us endeavouring to rekindle a feeling for our *own* English Gothic like Mr. Sharpe, and those who work in it with much success, adapting it to modern wants, like Mr. G. G. Scott, and others. Take, for example, the latter gentleman's work, the Midland Hotel, in the S. Pancras-road. Here we find picturesque outline, without extravagance and ill-proportion; variety without discord; in a word, a principle of gradation and unity of effect are observed. Again, why should the Classical, or rather the Anglicised modifications of the Italian, be neglected, as seen in the works of Mr. Penenethorne, Tarring, and others. It seems to me the Round arch style, whether strictly Romanesque or Byzantine, or not, is far too much neglected for modern civic and other commercial uses. Many successful variations of the Renaissance, too, are quite put aside in the rage for Gothic reproduction.

Turning to church architecture, the tendency to think and work in old grooves is very manifest. The rule of precedent, as regards arrangement, is still the uppermost—the old conventional tripartite church, with all its drawbacks and beauties, being that usually adopted; sometimes, perhaps, with a little noticeable modification or improvement, but generally merely a variation on the old model. The better-adapted plans of Mr. Cubitt and others, which have appeared in the BUILDING NEWS from time to time, in which a more rational system of arrangement and construction is adopted for our Protestant congregations, seem to be unappreciated at present, though I believe it will not be long before some such arrangement in the planning of modern churches be adopted, by the advanced church party at least. Taking the style of modern church building, though an improvement on that of a past generation, there is a doubtful introduction of crude, foreign, unartistic detail, which appears to me to be supplanting our own more honest Gothic styles, which, alas! are wofully

neglected. What, for instance, can be more repulsive than the heavy plate windows often noticed, bad in proportion and worse in detail; the ugly and ungraceful terminations to our towers; the skin-deep ornamentation of our wall surfaces, instead of the richer play of light and shadow of artistically-wrought mouldings. *Disproportion, crudeness, and flimsiness* are the characteristic qualities of these churches, and though there are many cheering exceptions, the influence of the same causes as I have adverted to in our national and civic architecture, the following of certain leaders, invidious to name, and the lack of a really sound professional training, are too painfully apparent. I may revert to this subject again.—I am, &c., G. H. G.

THE NEW NATIONAL GALLERY.

SIR,—Will you give me an opportunity of stating that the designs which I had the pleasure of preparing for Mr. Layard for the New National Gallery, one of which appeared in your last impression, have been made use of by the Office of Works entirely without my consent, and have been published in the Parliamentary return without any authority from me? My drawings were reduced to a small scale by means of photography, in order to illustrate a privately-printed pamphlet, and the reproduction of them full size in the return by means of lithography is anything but satisfactory, in consequence of the way in which they had been finished in order to be photographed. You are quite right in stating that the matter contained in the return was the result of a singular misunderstanding of what was wanted; it was more probably done to avoid the necessity of giving the correspondence which had been really asked for. Mr. Layard's pamphlet also was made use of without his consent, and he knew nothing of what had been done till I called his attention to your illustration last week.

When I found in August last that the work executed for Mr. Layard in a private capacity had been thus appropriated, I wrote to the secretary of the Office of Works to inquire how my drawings had come to be regarded as Government property, and I was informed that there was "no record showing how the plans came into the possession of the Department."

How far, as this is the case, their publication is lawful, I will leave your readers to judge. In the mean time, allow me to assure you that my work, in connection with Mr. Layard, was undertaken in April, 1868, before the appointment of Mr. Barry, and while the whole subject of the National Gallery was in abeyance. There was therefore no intention to interfere in any way with Mr. Barry's work, as it would appear in the absence of this explanation.—I am, &c., GILBERT R. REDGRAVE.

Kensington, July 26.

SIR,—The readers of the BUILDING NEWS, and the architectural profession generally, ought to be very grateful to you for the publication of the designs for the new National Gallery, respectively the production of Mr. E. M. Barry, A.R.A., and the Right Honourable A. H. Layard, assisted by Mr. Gilbert R. Redgrave, architect.

As it has been more than once reviewed in your columns, any remarks now upon Mr. Barry's design would perhaps be superfluous; but it is somewhat remarkable that the very features in the present gallery (the domes) upon which so much abuse has been lavished appear to be in the new design as weak in point of design and contour as it is possible for domes to be; the bases of them have the very objectionable trusses, the outlines are bad, and the terminations composed of trusses and spikes, excel in ugliness the tops of the domes of the old gallery. As regards the other portion of the design, it has, as you observe, "more the appearance of a town-hall than of a picture-gallery," and consequently, is totally inappropriate for the purposes for which it is intended.

It is with bewilderment and surprise that we contemplate the design of Messrs. Layard and Redgrave, and regret that your description of it was not a little more detailed; had it been so, we should probably have been informed that the portions to the right and left of the centre are alternative designs, although, judging from certain engineering architectural feats in the region of South Kensington, the possibility of the variation in style of the two sides being intended for another example of the originality for which the authorities in that quarter are so justly distinguished, is not remote; but why was not the centre line drawn? I cannot conceive it reasonable that any architect would suppose for one moment that the central feature in this design would alike suit either side, and yet the end masses and the balustrade at the top of the arcading

would incline one to the belief that such was the intention—that the two sides were alternative designs to be placed in conjunction with the same centre.

Of course from this drawing it would be almost impossible to accurately point out the respective portions of each gentleman's design, but from his classical knowledge one may assume that the centre, the building to the left of it, and the end masses, are what Mr. Layard would consider appropriate for a National Gallery in such a city as London, and for such a site as Trafalgar-square affords; and that it is to Mr. Gilbert R. Redgrave we are indebted for the dignified and graceful composition to the right of the centre; and whether this assumption is or is not correct, as Mr. Layard disclaims any "practical experience in architecture," it is his professional assistant to whom we look for explanation of this design. Is the whole thing a burlesque, or does he suppose it likely that such a production as this would be permitted in substitution for the existing gallery? The design has not even the merit of "insipid correctness"—starting with the rusticated basement—with "blocks as large as possible to give dignity, simplicity, and strength." Such a piece of work as this close to the eye of the spectator would be, in an artistic sense, intolerable; the centre is as weak in treatment as it could be; its cornice is entirely out of style, the facia of it being absolutely broken up by projections, extending through the frieze up to the corona—the whole of it is an abortion. And then the colonnades or "loggie." As regards proportion, perhaps that on the left of the centre would be passable; but that on the right! What beauty have we not here! What charming simplicity is embodied in its every detail, and how beautifully does it harmonise with the centre, the ends, the basement, and the balustrade at top; it is a masterpiece of correct design, and evidences a knowledge of Classic architecture not often met with. Poor Wilkins! When we think of the difficulties with which he had to contend in the erection of the National Gallery, and the result of his labours, and then look upon the design of Messrs. Layard and Redgrave as a substitute for it, moderation in language deserts one. Wilkins' design, taken as a whole, for the purposes of a National Gallery is as superior, artistically, to Messrs. Layard and Redgrave's as that of an accomplished architect would be to the production of an average schoolboy; and if they want a building displaying fine effects of light and shade, let them study the present National Gallery—if they want to become acquainted with the proper manner in which to design a centre and sides, let them visit the London University by Wilkins. To do this would convince them of the absurdity of their own, and would save us from a repetition of the result of a self-assurance that almost amounts to impertinence.—I am, &c., W. W.

SIR,—Mr. Layard rightly judges that "the building should tell its own story"—i.e., that it should bear unmistakable evidence, by its external architecture, of its use and object." Judged by this rule, could anything be more inconsistent and out of character than Mr. Barry's design, anything more preposterous than the three domes? Of the numerous picture galleries in Europe, good, bad, and indifferent, in no case is propriety so utterly sacrificed in the external design. These domes occupy a large area, which would be utterly wasted, as the space beneath them would be as useless for the display of sculpture as of pictures. It is said to be a common trick of artists on "Varnishing Day" to heighten the colouring of their pictures, though it permanently injures them, in order to kill those which hang near. And in competitions architects will put striking but *outré* features for similar objects, so perhaps these domes were designed. It is no use, however, to regard them as real parts of the design. They are mere incubi, which, costing as they must at least £50,000, neither Mr. Ayrton nor any sane successor to his office is likely to allow. Objectionable features in the design also are the long panels of sculpture, which in execution would be hidden behind the arcade. The tall attic, too, between the turrets has a most unfitting look, and, however justifiable our national equine taste, within due limits, may be, the prancing steeds on top of a picture gallery will probably be objected to by some. Whether it is only a fault of the engraving, I do not know, but the round-headed openings on ground floor have no other evidence of being *arches* than is afforded by their enormous *key-stones*.—I am, &c., M.

THE ALBERT HALL.

SIR,—I beg to be allowed to make a few remarks upon the latter portion of "Omicrou's" second

article, "Albertia," for I do not agree with the writer's statement that this hall is unfitted for developing musical sounds on a large scale. On the contrary, I consider it to be equal, if not superior, to most theatres and concert-rooms, provided that a proper use be made of it. We hear a general complaint of the echoes or dizzy burr whenever a full chorus with organ accompaniment is attempted; a disagreeable effect that is in no way caused by the building itself, but which must always take place with orchestras occupying so great a breadth (in this case nearly 200ft.), for the two end voices can only reach the hearer simultaneously when he is placed at the vertex of an isosceles triangle, of which the base is the breadth of the orchestra. In all other situations, the sounds from the extremities will reach the hearer one *after* the other, because the waves of sound do not travel instantaneously. Consequently the dizzy burr must always take place, more or less according to circumstances, with monster orchestras.

The solo singer is heard splendidly in most parts of this hall, which is rendered perfectly dumb to the ordinary echoes of empty rooms, by the audience, matting, drapery, and cushions; but a portion, however, of the audience situated in and about the arena, will hear a duplicate sound, apparently proceeding from the singer, unfortunately placed close to one of the foci of the elliptical hall, because his voice is concentrated in the opposite focus, and from thence is again feebly reverberated to the first, thus forming a Mephistophelian accompaniment to the singer, but invariably behind in time. The remedy will, of course, be to place the singer at the side of the ellipse, instead of at the end, and proof can be obtained without trouble or expense by placing the singer in that position with a full hall.

The writer of "Albertia" fears that the cost of such an alteration would be very great; but in the first place, the alteration will be found imperative, if the hall be intended for general purposes; and, in the second, with the exception of the organ, the expense would be trifling. At present, this really noble building, which does such high honour to the contractor and builders, is absolutely useless. In regard to the great organ, I should recommend, as I have already stated in former communications on this subject, to which I beg to refer your readers, that it be disposed of to some large cathedral more adapted for its use. The magnificent instrument in York Minster possesses a trumpet stop that makes the framing of the pews vibrate with sensible force, yet produces no disagreeable effect on the ear. And if an organ be required, a portable one may be obtained of sufficient power, seeing that a common barrel-organ carried upon a man's back can be plainly heard many streets off.

The "velarium" may certainly be dispensed with, as it is utterly useless for the intended purpose of lessening the amount of echo, because when the hall is full the audience entirely damps the echo from the ceiling. The canopy would be a very valuable addition to the "properties" of a travelling circus proprietor.—I am, &c., C. E.

THE EMPLOYMENT OF SURVEYORS.

SIR,—The Committee appointed by the Council of the Royal Institute of British Architects to consider the question of "the employment of surveyors," in accordance with the resolution of the General Conference of Architects, 1871, having authorised us to collect from all available sources reliable information respecting the appointment and employment of surveyors in reference to building works, we desire to avail ourselves of the publicity of your columns to invite the attention of architects, builders, measuring surveyors, and all others interested in this important question to the inquiry now being conducted, and to ask from them the immediate communication of detailed information as regards general principles or their own special practice.

We shall feel obliged by any communications on this subject being addressed to us at 7, Whitehall-yard, S.W.—We are, &c., ARTHUR CATES, T. M. RICKMAN.

GENERAL CONFERENCE AND PROVINCIAL ARCHITECTS.

SIR,—A resolution was passed at the late General Conference of Architects, appointing a committee to consider and report upon the subject of professional practice and charges of architects. A committee meeting has since been held, at which I was requested to take steps to elicit from the whole of the provincial architects their views and suggestions on these subjects. As comparatively few of the country architects are represented in architectural societies, and as it is almost impossible to communicate with every member of the profession individually, will you permit me, through the medium of your

journal, to invite suggestions as to professional practice and the Royal Institute scale of charges, in order that I may lay them before the next meeting of the committee, with a view to the preparation of a uniform scale of charges throughout the United Kingdom, to be discussed at the Conference in June next?

I shall be happy to give all particulars in my power to any provincial architect so requiring.—I am, &c.,

J. DOUGLASS MATHEWS,
Acting Secretary to Committee.

10, Cloak-lane, London, July 24, 1871.

BIRMINGHAM ASSIZE COURTS AND CORPORATE BUILDINGS.

SIR,—In publishing the award of the premiums in this competition, in your last issue, you say:—"In his report sent in as referee on the 8th of April last, Mr. Waterhouse selected the design marked 'Perseverantia' for the first premium," &c.

The following is from Mr. Waterhouse's report of that date:—"I have to say that the design which appears to me to merit the first place is that which, bearing no motto, has been numbered 9."

"I consider this to be, on the whole, the most masterly design of the series. Its general arrangements are eminently suited to the requirements of the case, and it has the merit of not being a copy, as far as I know, of any existing building of a similar character." After an extended commendation of this design, the referee continues:—"The only other designs I think it necessary to bring especially under your notice are the following:—"Perseverantia,' 'Forum,' In uno,' 'Desideratum.'"

The committee, it seems, considered that the instructions to architects had been disregarded in the design without a motto, and for this reason, it is stated, excluded it from competition for the premiums. At the same time, their report laid before the quarterly meeting of the Council on the 23rd of May, contains the following endorsement of the referee's opinion:—"Agreeing in opinion with Mr. Waterhouse that the design referred to as No. 9, without a motto, is the most masterly design of the series, and by far the best of the set, your committee recommend that they be authorised to treat with the author thereof for the acquisition of the drawings, so that the council may not lose the benefit of that design when it proceeds to consider the important question of erecting the contemplated buildings.—I am, &c.,

W. HENRY LYNN,

(Author of No. 9, without a motto).

Belfast, July 26, 1871.

Intercommunication.

QUESTIONS.

[2273.]—**Plaster Work.**—I should be glad to know (through "Intercommunication") what is the rule in measuring plaster work, viz.:—Are deductions made for door and window openings? In measuring cornices by the foot super, is there any extra allowance for angles? If so, what is it?—A YOUNG BUILDER.

REPLIES.

[2261.]—**Fireproof Flooring (French Method).**—Iron joists, placed at about 2ft. apart, are built into the walls, and connected by iron bars, say $\frac{1}{2}$ in. square. These iron bars are hooked to the joists, and laid at right angles to them, on a level with the bottom flange. Upon these bars, which are also placed at about 2ft. apart, long thin slips of iron (say three in number) are loosely arranged between the iron joists and parallel to them. Planks are now temporarily attached to the under side of the joists, and laid close to each other. Rubble, or hollow bricks, or *plastras* are then thrown on these planks, until the whole space between the joists is filled throughout their entire height. Liquid plaster of Paris is then run on, binding the rubble into a homogeneous mass. In twenty-four hours or so the planks may be removed, as the plaster will then have set, and the ceiling and cornice may be completed. The floors are generally finished with parquetry, and, to fix this, small oak sleepers are required. These are laid on the joists at equal distances, and set in plaster; the oak flooring is then nailed on them. Tiles may also be used with facility on this species of flooring.—JOHN SMITH.

[2264.]—**Modelling.**—The best clay for modelling is common pipe-clay; it can be had from any pipe maker in 9 in. cubes, price 6d. per cube unprepared. If you want it ready to hand, it will cost more. "F. L. E. P." will find clay work much better if it is mixed with one-third part of fine sand.—STONE CARVER.

[2267.]—**Blue Stone.**—There are several blue stones that retain their colour; but Mr. Garside does not say the tint he requires—dark or light blue. Blue stones that will stand are to be found in Cheshire, Gloucestershire, Leicestershire, Lancashire, and Yorkshire.—SAMUEL TRICKETT.

[2269.]—**Segment of a Circle.**—There is some mistake in the figures, as can be easily shown. The length of the arc is given at 410 links, the height or versed sine at 25 links, and the radius at 8,000 links. Putting C for the half-chord, R for the radius, and V for the versed sine, we find, by the well-known formula

$$C = \sqrt{2VR - V^2} = \sqrt{50 \times 8,000 - (25 \times 25)}$$

$= \sqrt{399375} = 631.93$. In other words, the half-chord is greater than the corresponding arc, a manifest absurdity. The same result can be also shown by plotting the segment of the circle to a large scale. Using the same notation, and calling A the area of the segment, its value may be obtained from the equation

$$A = \frac{4V}{3} \sqrt{(0.626V)^2 + C^2}$$

"Tables of Segments" are calculated, giving the length of the chord for different degrees, taking the radius as unity, and the length of the chord will be found by multiplying the numbers in the tables by the length of the radius of the circle.—L. L. C.

[2270.]—**Sash Pulleys.**—There are two kinds of pulleys used for sashes—axle and frame. In an axle pulley the wheel is mounted on an iron axle. The holes in the side-plates in which the axle revolves are bushed with iron, steel, or brass. Frame pulleys should only be used for very light and common work. The wheel revolves on a small iron pin, which is riveted at each side to the side-plates, and is not bushed. If "X. M. B." will procure one of each, he will at once see the difference between them. The quotation from Laxton means "axle pulleys" distinguished from "frame pulleys," and not "brass axles, in contradistinction to iron axles."—T. SCOTT.

[2272.]—**A Legal Point.**—If the light "X." mentions is what is termed an "ancient light"—that is, one which has not been interfered with for a term of twenty years—the owner can compel him to stop his building, if it diminishes the amount of light he receives by the window in question.—SURTIS.

Our Office Table.

MEETING OF THE INSTITUTION OF MECHANICAL ENGINEERS AT MIDDLESBROUGH.—On Tuesday the meeting of the Institution of Mechanical Engineers commenced at Middlesbrough, the meetings being held in the Odd Fellows' Hall; Mr. John Ramsbottom, the President, presiding. There was a good attendance, not only from the North of England, but from the Midland, Scotch, Manchester, and other districts, of gentlemen connected with the iron and engineering trades. Between 300 and 400 were present at the meeting, where papers were read from Mr. Crossley, of Askam, "On the Manufacture of Hematite Iron," and from Mr. J. L. Bell, "On the Preliminary Treatment of Materials Used in the Manufacture of Pig Iron in the Cleveland District," &c. Interesting discussions took place, in which a number of gentlemen joined. On Wednesday the meeting was resumed, on Thursday a dinner took place at the Zetland Hotel, Saltburn. During the week the different iron-works, iron mines, &c., have been visited.

HAND-TURNING IN THE CITY.—The Master, Wardens, and Court of Assistants of the Worshipful Company of Turners, in continuance of their action last year, propose to give, each year, their silver medal and the freedom of the company and of the City of London to any one workman or apprentice in the trade who may send in the best specimens of hand-turning for the year. Further information may be obtained of Mr. Charles Ireland Sheriff, 59, Mark-lane, London.

THE THAMES EMBANKMENT GARDENS.—On Saturday evening the large garden which lies between Waterloo and Charing-cross bridges, on the Victoria, or Northern Embankment, which had been formally made over to the public on the previous day by the Metropolitan Board of Works, was crowded by people of all classes, who seemed thoroughly to enjoy the green spot which has been placed at their disposal. A broad path runs through the middle of the garden from one end to the other, and to this pedestrians are confined, as the grass is at present not in a strong state, and what flowers there are have but recently been planted. The smaller garden, which lies between the Temple-gardens and the Temple railway station, is not yet in a fit condition to be thrown open to the public.

NEW SYSTEM OF FORTIFICATION.—An improved iron fort has been invented by Mr. Thos. Welton, of Grafton-street, Fitzroy-square; he proposes to build a series of arches, with suitable tramways beneath the ground level, and he provides a hydraulic lift for raising a mitrailleuse or other similar weapon, as desired. There are facilities for keeping the ammunition beneath water, and for ventilating the fort. With such an arrangement a siege could be maintained for an almost unlimited time, as the garrison would be but few in number, and the fort could be provisioned for any length of time.

DEATH OF M. G. SOMMEILLER.—The *Gazzetta del Popolo* of Turin announces with profound regret that the illustrious G. Sommeiller, the colleague of Grandis and Grattoni, the perforator of Mont Cenis, died on the 11th inst., at his native place, about one o'clock in the afternoon. "He has died in the midst of his triumph, and, like Cavour, when his great work is done, but not completed. The monument of this eminent man is already raised, '*Alpes enarrant gloriam ejus*.'"

BANGOR SLATE.—A great discovery of slate, the famous Bangor grays, has been recently made by some Anglesea gentlemen at a place called Plas-y-Nant, near the celebrated Nant mill and waterfalls, about five to six miles from the town of Carnarvon, alongside the main road, leading to Beddgelert. The land belongs to the Baron Hill estate, and has been under lease for a great many years; but it appears the late proprietors worked on a blue but separate vein of slate in the eastern part of the property. It appears, however, the well-known quarry proprietor, Mr. Brewer, had hit on this great vein some time before his death. Little or nothing, however, was done until recently, when Mr. Edmund Spargo and one or two of his Anglesea friends made a fair start. The samples of slates obtained within a few yards of the surface are characterised as truly marvellous for the depth. Slates of all the usual marketable sizes have been obtained within a few yards of the surface. The vein is estimated to be at least 300 yards wide. The working facilities, in all respects, are said to be most advantageous, which includes water power to any extent.

Chips.

Vice-Chancellor Wickens, on the petition of three advanced members, has granted an order for the winding-up of the Professional, Commercial, and Industrial Benefit Building Society.

On Monday week, the employees of Mr. E. Welby Pugin, of the South Eastern and Granville Works, to the number of 220, assembled for a day's recreation. They left the South Eastern Works, at half-past seven o'clock, in waggons, and under the direction of Mr. James Knight Morley, the manager of the firm, proceeded through the town, headed by the Artillery band, to Fredville-park, in the parish of Nonington.

The Paris journals state that the commission of engineers appointed to report upon the construction of a tunnel between England and France, have designated MM. Stronsberg & Co., of Berlin, as constructors of the tunnel.

The additions to St. John's Church, Weston, consisting of a transept, apse, and porch, are now almost completed, and the building will, no doubt, be re-opened on an early day.

A brass tablet to the memory of Charles Lamb is about to be placed in the parish church of Edmonton, in the churchyard of which the poet's remains were interred.

Timber Trade Review.

PRICES, July 24.—Timber per load of 50 cubic feet:—Riga, £3 5s. to £3 7s.; Dantzic and Memel Crown, £4 to £4 10s.; best middling, £3 5s. to £3 15s.; good middling and second, £3 to £3 5s.; common middling, £2 10s. to £2 14s.; undersized, £2 10s. to £2 15s.; small, short, and irregular, £2 to £2 10s.; Stettin, £2 10s. to £2 15s.; Swedish, £2 10s. to £2 15s.; ditto small, £2 5s. to £2 8s.; Swedish and Norway balks, £1 12s. to £1 18s.; Memel crown oak, £5 10s. to £6 10s.; ditto brack, £4 10s. to £5 5s.; Dantzic and Stettin Crown oak, £3 15s. to £4; ditto brack, £2 to £2 7s.

Deals, &c., per S. Petersburg standard:—Soderham, first and second quality mixed yellow, £8 10s. to £9 10s.; Skellifted mill-sawn yellow battens, £8; Quebec third floated yellow pine, £9 10s.; ditto third bright, £9 5s. to £9 10s.; ditto second bright, £13 to £14; ditto first dry floated, £18 to £19 10s.; ditto first floated, £17 5s.; ditto first bright, £19 5s.; the above being 12ft. 3in. by 11in. Petersburg first yellow battens, 3in. by 7in., £12 15s.; ditto first white, 3in. by 9in., £9; Nystadt mill-sawn yellow battens, £7 to £7 5s.; short length, 6ft. to 11ft., £5 10s.; Kragero first and second quality mixed yellow battens, £7; short lengths, 6ft. to 11ft., £5 15s.; ditto second yellow, £6 15s.; ditto first and second quality mixed whitewood, 2½in. by 7in., £6 10s.; 2½in. by 6½ in., £6 5s.; ditto third whitewood, 2½in. by 6½in., £5 10s.; Gedde third yellow, 3in. by 11in., £9 10s. to £10; 3in. by 9in., £9 10s. to £9 15s.; ditto fourth yellow, 3in. by 9in., £8 10s.; Gothenburg first and second quality mixed whitewood battens, £7 10s.; Frederikstadt second yellow battens, £6 15s.; Dram third yellow battens, 2½in. by 9½in., £6 5s. to £6 15s.; ditto third whitewood, £5 2s. 6d. to £6; ditto first yellow, £6 to £6 10s.; Husum third yellow, £7 15s. £8; whistla Wary third yellow, £7 10s.; Archangel best yellow, 3in. by 11in., £14 10s.; 3in. by 9in., £12 10s. to £12 15s.

Dantzic crown deck deals, per 40ft. of 3in 18s. to 21s. 6d.; ditto brack, 12s. to 16s.

Trade News.

WAGES MOVEMENT.

BERLIN.—The masons have struck work at Berlin. The carpenters and blacksmiths are said to be about to follow their example. In consequence of the continuance of the masons' strike, the Government is employing soldiers, and has issued orders to the regiments in Berlin to tell off all men in their ranks trained to masons' work for the duty of building the new House of Parliament, which is in danger of not being completed in time. Disturbances have occurred among the masons, the strikers assaulting those who continued work, and the police have arrested forty of the rioters. The masters have held a meeting, and passed a resolution to yield nothing, in order not to encourage more strikes.

TENDERS.

CAMBERWELL.—Grove Hall Asylum, for new laundry buildings. Messrs. Tolley and Dale, architects.

Corder	£1744
Pritchard	1568
G. S. S. Williams and Son	1533
Ennor	1480
Wicks, Bangs, and Co.	1461
Kilby	1462

FOLKESTONE.—For Portland cement concrete farm buildings at Folkestone, for the Earl of Radnor. Mr. Stringfellow (the agent on the estate), architect. Old stone, &c., to be re-used:—

Pope	£625
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GUILDFORD.—For alterations at the rear of No. 23, High-street, Guildford. Mr. H. Peak, architect:—

Garnett	£261 9 0
Strandwick	228 0 0
Bristow & Burdett	143 3 0

HIGHBURY.—For additions to Christ Church, Highbury, N. Mr. Thos. Allom, F.R.I.B.A., architect. Quantities by Mr. Bagg, 21, Whitehall-place.

Colls & Son	£1945
Henshaw	1935
Brown & Sons	1897
Hill & Son	1894
Perry & Sons	1867
Jackson & Shaw	1850
Hill, Keddell, & Waldram	1845
Patrick & Son	1815
Dove Brothers (accepted)	1755

ISLINGTON.—For stables, Elder-walk, Islington. Mr. James Harrison, architect.

Ennor	£475
King & Sons	458
Brown & Robinson	439
Williams & Son	423
Little	399
Pahner & Son	395
Carter	395

LONDON.—For alterations to Messrs. Russell, Campbell, and Co.'s offices, St. Mary Axe. Mr. Alfred M. Ridge, architect:—

Carter & Sons	£536
Turner & Son	491
Elkington	491
Klug & Sons	480
Capps & Ritso	418

LONDON.—For a warehouse, Watling-street, including part of fittings. Mr. Herbert Ford, architect:—

Dowds	£8229
Gammson and Son	8697
Coles	8296
Stimpson	8193
Dove Brothers	8155
Hill, Keddell, and Waldram	7998
Brass	7610
Perry Brothers	7554
G. Pritchard	7460
J. Moreland	7400
Brown & Robinson	7279
E. Conder	7263
Henshaw and Co. (accepted)	7060

ROTHERHITHE.—For the erection of new schools, classrooms, &c., at Cobourg-street. Mr. H. J. Hanson, architect:—

Cawdron	£1042 0 0
Atkinson (too late)	745 0 0
Peskett & Taylor	720 0 0
Spencer Maynard	710 6 0
Brown Brothers	670 0 0
Bradley (too late)	669 0 0
Pitcher	668 0 0
Dauell	665 0 0
Bulmer	664 0 0
Bragger	659 0 0
Nightingale (too late)	637 0 0
Cooke	600 0 0
Stephenson	597 0 0
Kipps	593 0 0
Carmody	575 0 0
Pearce	572 0 0
Machin	563 0 0
Harrison & Edwards	560 15 0
Gooding	530 0 0
Crook & Wall	528 0 0

SURREY.—For addition to Sand National School, Surrey. Mr. Henry Peak, architect, Guildford:—

Knight & Sons	£200 0 0
Bristow & Burdett	181 9 6
Mason	179 5 0
Swayne & Sons	165 0 0
Sturdy (accepted)	135 0 0
Whitburn	98 0 0

SYDENHAM.—For the erection of a pair of semi-detached villa residences, Plot 28, Crystal Palace Park Estate. Mr. John Norton, architect. Quantities by Mr. Thacker:—

Pearce	£4017 0 0
Shapley & Webster	3900 0 0
Wright Brothers, & Goodechild	3895 3 0
Thompson	3614 0 0
Moore & Grainger	3584 0 0
Nightingale	3573 0 0

Peskett & Taylor	3495 0 0
Waterson & Co.	3410 0 0
Plummer	3312 7 0
Watson Brothers	3240 0 0
Stephenson	3233 0 0
Crossley	3095 0 0
Roberts	3076 19 0
Ball	3075 0 0
Gooding	2986 0 0
Bysh	2940 0 0

CONTRACTS OPEN FOR BUILDING ESTIMATES.

CAISTON UNION, August 11.—For the erection of a detached infirmary and fever wards.—G. R. F. Had-delsey, clerk.

GREAT NORTHERN RAILWAY, August 4.—For the construction of the Bradford, Ecclehill and the Idle, and the Idle and Shipley Railways.—Mr. Fraser, 18, York-place, Leeds.

PETERSFIELD GAS, COKE, AND OIL COMPANY, August 1.—For the supply of 300 tons of New Pelton coals.—Mr. Duplock, sec.

PADDINGTON VESTRY, July 31.—For the construction of two fire-proof closets and other works in the vestry hall.—F. Dethridge, clerk, vestry hall.

WAR DEPARTMENT CONTRACTS, August 1.—For the erection of a provost prison at Colchester.—Royal Engineer Office, Colchester.

ROCHESTER, August 7.—For the formation of public gardens and walks, and approaches.—R. Pratt, town clerk, Rochester.

CHRIST CHURCH DISTRICT, NEW MALDEN AND COOMBE, SURREY, August 3.—For the erection of a boys' school, class room, &c.—H. T. Freshwater, architect, 40, Norfolk-street, W.C.

CAMBRIDGESHIRE.—For the pile-driving and foundations of two bridges.—D. Oldfield, 7, Westminster-chambers, S.W.

NORTH LONDON RAILWAY COMPANY, August 2.—For widening the railway from Broad-street (Moore's Gardens) to Dalston Junction.—R. S. Mansel, secretary, Euston Station, N.W.

GREENWICH UNION, August 3.—For painting the exterior of the workhouse.—S. Saw, clerk.

GREENWICH UNION, August 3.—For external repairs at the workhouse.—S. Saw, clerk.

SOUTH EASTERN RAILWAY COMPANY, August 1.—For the supply of 88,000 tons coking coal.—J. Shaw, sec., London Bridge.

ST. MATTHEW, BETHNAL-GREEN, July 31.—For the erection of an infirmary at Leytonstone.—W. Howard, clerk, vestry hall.

WHARFEDALE UNION NEW WORKHOUSE, &c., August 2.—For the erection of a new workhouse, entrance buildings, infirmary, &c., on land at Newall, near Otley.—Christopher John Newstead, union clerk.

ROCHDALE AGRICULTURAL SOCIETY, August 26.—For the erection of a covered stand at their forthcoming show, to hold 800 persons.—James Taylor, secretary, 2, the Orchard, Rochdale.

BATH, August 5.—For scavenging and cleaning the borough for a period of seven years.—E. Parfitt, city surveyor, 3, Terrace-walks, Bath.

HASTINGS, August 9.—For the erection of a block of dwellings in flats.—G. Friend, architect, 41, Earl-street, Maidstone.

MIDLAND RAILWAY, August 1.—For the erection of warehouse, shops, and other buildings on land adjoining the High-street, Bow, S.E.—Secretary, Way and Works Committee, Midland Railway, Derby.

BENGEWORTH, BOROUGH OF EVESHAM, August 11.—For the erection of a new parish church.—Messrs. Barry & Son, architects, 28, Church-street, Liverpool.

BATH AND OTHER BUILDING STONES, OF BEST QUALITY.

RANDELL, SAUNDERS & CO., Limited, Quarrymen and Stone Merchants.

List of prices at the Quarries and Depôts, also cost of transit to any part of the United Kingdom, furnished on application to

BATH STONE OFFICE:
[ADVT.] CORSHAM, WILTS.

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As supplied to H.R.H. The Prince of Wales at Sandringham The Penmoyle Sea-green Slates are specially adapted for Churches, Public Buildings, &c., &c.

(Less costly than ordinary Gothic Tiling.)

These durable and non-absorbent Slates can be obtained in sizes suitable for Gothic Architecture, at prices as under.

In Railway Trucks, Docks, Gloucester:—

	Per Equivalent to 1,200 Slates, per square
Best Green Slates 14 by 7 ...	2 17 6 ... 16s. 6d.
Do. do. 13 by 8 ...	2 17 6 ... 16s. 6d.
Do. do. 13 by 7 ...	2 5 0 ... 14s.
Do. do. 12 by 7 ...	1 18 6 ... 13s.
Do. do. 12 by 6 ...	1 7 6 ... 11s.

Prices of large Sizes, Cost of Transit, Reference Testimonials, and Sample Specimens may be obtained on application to

MESSRS. RANDELL & CO., Corsham, Wilts.

Specimens at Museum of Geology, Jernyn-street, Piccadilly, W., and at Architectural Museum, Tufton-street, Westminster.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.			
LEAD.			
Pig—Foreign	per ton	£17 12 6	£17 15 0
" English W.B.	do	20 0 0	21 10 0
" Lead Co.	do	18 10 0	18 15 0
" Other brands	do	18 0 0	18 10 0
Sheet Milled	do	18 15 0	19 0 0
Shot, Patent	do	20 10 0	21 0 0
Red or minium	do	20 10 0	21 0 0
Litharge, W.B.	do	0 0 0	0 0 0
White Dry.	do	25 6 0	26 0 0
" ground in oil	do	0 0 0	0 0 0
COPPER.			
British—Coke & Ingot	per ton	75 0 0	76 0 0
Best Selected	do	77 0 0	78 0 0
Sheet	do	77 0 0	81 0 0
Bottoms	do	81 0 0	82 0 0
Australian	do	75 0 0	79 0 0
Spanish Cake	do	68 0 0	69 0 0
Chili Bars, cash	do	67 15 0	69 10 0
" Refined ingot	do	75 0 0	77 0 0
Yellow Metal	per lb.	0 0 6 1/2	0 0 7 1/2
IRON.			
Pig in Scotland, cash	per ton	3 0 7	0 0 0
Welsh Bar, in London	do	7 5 0	7 10 0
" do Wales	do	6 12 6	6 15 0
Staffordshire	do	7 15 0	8 5 0
Rail, in Wales	do	6 15 0	7 0 0
Sheets, single in London	do	9 5 0	10 5 0
Hoops, first quality	do	8 15 0	9 5 0
Null Rod	do	7 10 0	7 15 0
Swedish	do	9 15 0	10 0 0
OILS, &C.			
Seal, pale	per tun	83 10 0	84 0 0
Sperm body	do	81 0 0	81 10 0
Cod	do	35 0 0	0 0 0
Whale, South Sea, pale	do	34 0 0	0 0 0
Olive, Gallipoli	do	49 10 0	50 0 0
Cocanut, Coochin, tun	do	50 0 0	51 0 0
Palm, Ilo	do	37 0 0	37 10 0
Linsed	do	32 10 0	0 0 0
Rapessed, Eng. pale	do	43 10 0	0 0 0
Cottouseed	do	28 10 0	24 10 0
TIMBER.			
Teak	load	12 5 0	13 10 0
Quebec, red pine	do	3 15 0	4 15 0
" yellow pine	do	4 5 0	5 5 0
Quebec oak, white	do	6 0 0	6 5 0
" birch	do	3 10 0	5 0 0
" elm	do	3 10 0	4 0 0
Dantzic oak	do	4 10 0	6 10 0
" fir	do	2 7 0	4 5 0
Memel fir	do	2 10 0	3 10 0
Riga	do	3 5 0	3 10 0
Swedish	do	2 5 0	2 15 0
Masts, Quebec red pine	do	4 0 0	6 10 0
" yellow pine	do	4 0 0	6 10 0
Oregon	do	7 0 0	9 0 0
Lathwood, Dantzic, fm.	do	3 0 0	5 0 0
St. Petersburg	do	5 5 0	5 15 0
Deals, per C, 12ft. by 3 by 9in.	do		
Quebec, white spruce	do	12 10 0	18 0 0
St. John, white spruce	do	12 10 0	14 10 0
Yellow pine, pr reduced C	do		
Canada, 1st quality	do	18 0 0	19 10 0
" 2nd do	do	12 5 0	13 10 0
Archangel, yellow	do	12 10 0	14 10 0
St. Petersburg, yellow	do	13 0 0	13 10 0
Finland	do	7 5 0	8 0 0
Memel and Dantzic	do	0 0 0	0 0 0
Gothenburg, yellow	do	8 10 0	10 10 0
" white	do	8 10 0	9 0 0
Gelle, yellow	do	10 10 0	12 10 0
Soderham	do	8 10 0	12 0 0
Christiana, per C, 12ft. by 3 by 9in., yellow	do	10 0 0	12 10 0
Other Norway	do	7 0 0	8 0 0
Flooring boards, pr square of lin., first yellow	do	0 9 0	0 10 0
First white	do	0 8 0	0 9 0
Second qualities	do	0 6 0	0 8 0

BANKRUPTS.

TO SURRENDER IN LONDON.

Causton, Arthur, Walthamstow, surveyor, and Pentonville-road, auctioneer, August 2, at 12.—Kain, John, Walthamstow, builder, August 4, at 11.

TO SURRENDER IN THE COUNTRY.

Lankford, James Frederick, Brislington, cement merchant, August 2, at Bristol.—Jowett, Joseph, Liverpool, timber bender, August 9, at Liverpool.

PUBLIC EXAMINATIONS.

November 8, T. Chaplin, Baltic-place, Lower-road, Rotherhithe, builder.—September 28, T. W. West, Maidenhead, builder.—August 25, A. Hutchinson, Birmingham, rivet maker.—August 14, F. Hawkins, Upper Norwood, builder.

DIVIDEND MEETINGS.

July 31, W. Shaw, Saddleworth, timber merchant.—July 31, G. Ward, Blackburn, builder.—August 7, M. Abrahams, Dover, glazier.

SCOTCH SEQUESTRATION.

William and Robert Borland, Kilmarnock, joiners, July 26, at 12.

PARTNERSHIPS DISSOLVED.

Welch and Brune, Eden-street, Hampstead-road, mechanical engineers.—Dalton and Cook, New Windsor, timber merchants.—Orton and Fathers, Southam, builders.—The Cleveland Bolt and Nut Company, Middlesbrough.—White and Brothers, Millbank-street, cement manufacturers.—R. and W. Hawthorn, Newcastle-upon-Tyne, engineers.—Rowbotham, Ezard, and Sykes, Bradford, ironfounders.—Banks and Co., Manchester, ironfounders.—Wood & Co., Lee Quarries, near Bacup, stone dealers.

SMALL-POX, FEVERS, AND SKIN DISEASES.—The predisposition to is prevented by Lamplough's Pyretic Saline. Agreeable, vitalising, and invigorating, its effects are remarkable in their cure and prevention. Take it as directed. Sold by chemists and the maker, H. Lamplough, 113, Holborn-hill.—[ADVERTISEMENT.]

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 4, 1871.

A RAMBLE BY THE RIVER NEN.*

FROM Raunds to Ringstead is about two miles; and here there is a smaller, though still an interesting church. Amongst its windows are some good flowing Decorated ones,—rather a rarity in Northamptonshire, where work of this period is by no means abundant. As may usually be assumed in this district, if the contrary is not stated, it has a broach spire of Early date. The railway and the river are not far from the village, and the tourist cannot do better than take the train for Thrapston. The town itself has little or nothing that is noteworthy, but it will serve as a central point from which to explore the neighbourhood. A pretty walk of two or three miles leads from Thrapston to Woodford, where there is a church with some Early details worth going to see. The south porch is, for such a building, remarkably fine, and its inner doorway would not disgrace a much more important work. The opening is a trefoil arch, with good mouldings. Above this is a well-carved semicircular arch, and rising still higher from the same level is the pointed wall rib of the vault. The jamb contains three detached shafts, and two engaged ones, with moulded caps and bases—an unusually elaborate composition for a village church, even in this county of mouldings. The pleasantest way back to Thrapston is across the meadows, by way of Denford. This church has a parapet, with four small pinnacles at the base of its broach spire, and not much else to attract attention. There is a more noticeable one at Islip; and walking over Thrapston bridge to reach it we see the Nen at its best. It widens out here into a sort of quiet little lake, bordered with red flowering rushes and purple loosestrife, and dotted over with the scented flowers of yellow water-lilies. Still and deeper than the upper Thames, it is not quite so sleepy as the Stratford Avon; it is a good place for swimming in summer and skating in winter, and though very few rowing boats are ever seen on it, it is navigable for barges as far as Northampton. The church we are now in quest of, and which is only a short distance beyond the bridge, is purely Perpendicular; but it is a favourable specimen of the style, and though it supplies few details for the sketchbook, its tower and crocketed spire are decidedly graceful. The next village is Luffwick, or, as it is commonly called, Lowick, and here there is another Perpendicular church. This one, however, has a square tower, ending in an octagonal lantern, the low roof of which is surrounded by battlements and pinnacles. Incorporated with the plinth, according to what seems to have been a local fashion in the fifteenth century, is a band of large quatrefoil panels; and similar bands are placed under two of the upper stringcourses. At Titchmarsh, a village three miles from Thrapston in another direction, the plinth has three such bands of quatrefoils, one above another, making up a total depth of seven or eight feet; and there are four or five more of them at various heights above. This ornament is very conspicuous, and does not demand a painful amount of thought on the part of its designer—two merits, such as they are, which it might be feared would have made it popular before now in modern London. The tower of Titchmarsh church is, however, on the whole, a fine one. In character it belongs more, perhaps, to Somerset than to Northamptonshire. It is of the class which have a central pinnacle on each face, in addition to the four corner ones, and the line of parapet is still further broken by traceried gablets or tall, pointed battlements, two on each side. The west doorway, like

those at Islip and Luffwick, has a crocketed ogee head, inclosed by a square label; the spandrels, as usual, are filled with cusped circles. There is a good Decorated north doorway, whose jamb, in place of shafts, contains three filleted rolls, with moulded caps and bases. Three or four miles from Titchmarsh, and on the opposite side of the Huntingdon-road, is a church which will supply more details for the sketch-book—that of Keyston. This is just within the boundary of Huntingdonshire, but it has all the characteristics of the Nen valley churches, and especially their most marked one—the tall broached spire. The beautiful little trefoiled doorway on the south side has been already described under the head of Irchester. The western one, a tower porch, like those at Higham Ferrars, Raunds, and many other places, has its outer arch doubly cusped, the mouldings resting on octagonal capitals. Below the spire-eaves are a range of square-headed tracery panels, different from the usual quatrefoil bands before described. Perpendicular broach spires, it has sometimes been asserted, are scarcely ever met with; the truth of the remark, however, is not confirmed by what may be seen in this neighbourhood. A mile beyond Keyston is a conspicuous example of one, in the village of Bythorne, and several others could be easily pointed out. Whatever may have been the case elsewhere, here the force of habit seems to have conquered the predilections of style.

Hitherto we have noticed no buildings but those within four or five miles, at most, from a railway station. There is, however, one object of sufficient interest to repay an excursion of nine or ten miles from Thrapston, namely, Gedding Cross. The walk is a pleasant one, much of it amongst those interminable avenues of elm-trees which are a curious feature of the district, and which run, often with neither road nor pathway beneath them, across grass lands and ploughed fields indifferently. At Twywell, the first village on the way, there is a good priest's door of the later Norman period, its square head corbelled out by carved rolls, and the tympanum between this and the circular dripstone filled in with overlapping lozenge ornaments. A star pattern is worked on one of the mouldings, and a cable on another: an old escutcheon and some plain hinges still remain on the door. The Eleanor Cross at Geddington, unlike the Northampton one, stands in the midst of the houses. It is entirely different from the other two, and hitherto has probably escaped restoration. Its plan is triangular, the lowest stage solid, covered with diaper, and with no projections save the small buttresses which rise from the plinth to carry the canopies of the second story. Here, as at Northampton, there are statues of the queen, each sheltered by a crocketed gable resting on a trefoiled arch, while above them a group of pinnacles cluster round the central pier which rose high and slender to support the terminal cross. The monument, from its out-of-the-way situation, is perhaps less known than it deserves to be; the variety of its surface ornament alone would entitle it to a visit. It is time, however, to proceed on our way to Peterborough, and returning to Thrapston, we will start across the meadows to Aldwinkle. Here there are two churches and two villages joined so closely that it is hard to say where the one ends and the other begins. The church of St. Peter's, in the upper one, has a well-proportioned though simple tower and spire of early fourteenth-century character, and a number of other details of the same date. That dedicated to All Saints, in the lower village, has a Perpendicular tower, bristling with gargoyles and grotesques at every corner. It has, moreover, some interesting lead shoots to throw the water well away from the clerestory walls, and as we omitted to mention, there are some still better ones, of highly ornamental design, at Woodford Church. The most elaborate we ever

happened to see are to be found some ten miles from Thrapston, at Layton, near the road to Huntingdon, and are really astonishing for their size, and the profusion of work they contain. Ancient leadwork is not very common in this country, and these examples, though, according to the dates they display, not older than the seventeenth century, are yet Mediaeval in design as well as construction. Those at Woodford are most so, and perhaps may have been copied from older ones. Opposite Lower Aldwinkle Church is the house where the poet Dryden was born. Two or three miles off, returning through the upper village, is an interesting relic of the Gunpowder Plot. Liveden New Building, as it is called, is scarcely a ruin, but looks like what it is, an unfinished mansion. It stands far away from any village, shut out from the world, in a little open space between four woods. It is reached through long grass-grown avenues, and deserted-looking tracks amongst the trees, so that nothing is easier than to beat about for hours in its neighbourhood and yet miss it. It is a large and elaborate house, or rather monastery, built on a cruciform plan and in the most substantial manner of freestone, and adorned with monograms and carvings of a mixed Gothic and Elizabethan style. It was in course of erection by some of the conspirators, it is supposed for religious uses, when the plot was discovered; and except that the floor timbers were cut out by the Parliamentary troops in the time of the civil war, it remains as it was left. A roof it never had, and, according to the local superstition, never can have, since whatever is put on in the daytime is sure to be removed at night. The walls, however, are perfect; the ornament is as sharp and clear as ever; and, coming on it suddenly in the utter loneliness of the woods, one might fancy it an enchanted castle or the palace of some sleeping beauty. On the way back towards Thorpe Station, the little church of Wadenhoe is only a field or two from the road. It is picturesquely situated, on a steep hill, with the river winding through the meadows at its feet, and the village of Aelchere full in view on the other side. At the latter there are some good buttresses, and a well-moulded doorway of the earliest Pointed style. Thorpe has no church; but there is a moated grange, with stepped gables, and a singular Gothic barn with two bull's-eyes in its gable, suggesting, with the intervening chimney, and apparently meant to suggest, the idea of a grotesque face. We must pass rapidly on, however, and can do little more than enumerate the remaining places of interest. Barnwell, the next station, has the remains of a Transition Norman castle, worth examining. Its church, besides some good Early Gothic windows, contains several puzzling details, in the shape of inverted caps used as bases, and similar misapplied features. The mystery is explained by the fact that they were brought from another building, destroyed some years since, and put where they are by the advice, probably, of the village mason. Oundle has a fine tower, and a large group of lancets in its chancel. Warrington and other noted churches are not far off. Within a mile of Elton Station stood Fotheringhay Castle, where Mary Queen of Scots was imprisoned and beheaded. It was pulled down by order of James I., and not a stone of it remains. Castor was an important place under the Romans, and has an ancient church. Peterborough Cathedral, the end of our ramble, is too well known to need description; and were it not, a book, instead of an article, would be needed to do it justice. Its painted ceiling, its surrounding buildings, but above all its imposing west front, give it a place apart and quite distinct from any other of our great ecclesiastical remains.

The memorial-stone of a new church was laid by Lord Shaftesbury in Finchley New Road on Tuesday last.

* Concluded from p. 63.

NOTES ON CARPENTRY, AND ON STRAINS IN STRUCTURES.—II.

THE force with which the fibres of a beam resist the strain put upon them depends upon two things combined—viz., their number and their distance from the neutral axis of the beam, or that line which separates the tensile from the compressive strains. This line is near the middle of the depth of a beam, and it would be exactly in the middle of the depth if the forces with which the fibres resist extension and compression were equal; but the ratio which these two forces bear to each other in timber has never been very accurately determined, and for the purpose of ascertaining the dimensions of a piece of timber to sustain a given strain it is not practically important that this exact position should be ascertained, because the dimensions proper to be given to a beam of rectangular or other section depend upon experiments made upon pieces of the same forms as those used in practice, and it is the combination of the two powers of a beam to resist strains—that of compression and that of extension—and not the power of either of them separately, that has to be considered; and therefore the distances at which the fibres act may be taken to be proportionate simply to the depths of beams. It is, however, useful to know whereabouts the neutral axis lies, in case it be necessary to cut a hole horizontally through a beam for the purpose of a bolt or otherwise, for in all such cases a hole should never be cut through it *below* the neutral axis, for that would at once diminish the power of the beam to resist the tensile strain, by removing the fibres upon which its strength depends, and if a hole be cut through a beam above the neutral axis, it should be tightly filled with a material quite as hard as the wood cut away, in which case its strength is but little, if at all diminished. For this purpose it is sufficient to suppose the neutral axis to be in the middle of the depth of a beam.

In respect of the numbers of the fibres, and the distances at which they act being, in combination, the measure of the resistance of a beam, an instance may be taken of two beams, one of which is half as deep again as the other, the breadth of the two being the same. In this case the deeper beam contains half as many more fibres as the other, and they act at a distance half as great again; and combining these two elements of strength, the deeper beam will have $(\frac{1}{2} \times \frac{1}{2} =) \frac{1}{4}$ times the power of resistance to a given strain that the other beam has; or if the depth of one be twice that of the other, it will have $(2 \times 2 =) 4$ times the power of resistance, or, in other words, the resistance is as the square of the depth. But the strength of a beam twice as wide as another, the depth of the two being the same, is but twice that of the other, for while it equally contains twice as many fibres, they act only at the same distance in both beams.

The power of resistance to strains is therefore inversely as the length, directly as the breadth, and as the square of the depth, in all beams upon which the load acts transversely.

We have hitherto been considering the case of a beam upon which the whole load is concentrated at an intermediate point of its length, but in many cases in practice, perhaps in most, the load is distributed uniformly over it, and to find the effect of such a load, the weight of each portion must be multiplied into the distance at which it acts from its point of support, and the product, if divided by the whole length, will give the weight that, if concentrated in the middle, would produce the same strains in the beam. Thus, in the beam that we have already instanced, of 15ft. bearing and carrying 6 tons, if the 6 tons were uniformly distributed, there would be 8 cwt. on each foot in length of the beam, and the distance of the centre of gravity of each successive weight of 8 cwt., measuring from one side towards the other,

would be $\frac{1}{2}$ ft., $1\frac{1}{2}$ ft., $2\frac{1}{2}$ ft., $3\frac{1}{2}$ ft., and so on to the last term, which would be $14\frac{1}{2}$ ft. Now if 8 cwt. be multiplied into each of these distances successively, the product will be found to be 45 tons, which, divided by the whole length of 15ft., gives 60 cwt., or 3 tons, as the weight which, if concentrated at the middle of the length, would produce the same strains in the beam as a weight of 6 tons does when uniformly distributed. And conversely, if it were required to find what weight uniformly distributed would produce in the beam the same strains as a load of 6 tons does when applied in the middle, multiply the six tons, or, for convenience, say 120 cwt., into the whole length of 15ft., and divide the product by the sum of the distances $\frac{1}{2}$, $1\frac{1}{2}$, $2\frac{1}{2}$, $3\frac{1}{2}$, &c., as before (which, in this case will be $112\frac{1}{2}$), and the result will be the weight which, uniformly distributed, will produce the same strain as 6 tons at the centre. It will be found in this case to be 12 tons, so that a beam will carry twice the weight, if uniformly distributed, that it will carry if it be applied at the centre, the strain on the beam being the same in both cases. And, as the strength of a beam is inversely as its length, it may be twice as long under a distributed load as another beam which is loaded at the centre, the strains in the two being of the same intensity, or, its length being the same, its breadth may be reduced by one half, or, the length and breadth remaining the same, the square of its depth may be reduced in the same ratio.

Each kind of material has its own specific strength, that is to say, its strength relatively to the strength of other kinds, and when, from experiments, we know the specific strength of any kind of timber, the proper dimensions for any particular case may be found from these general rules, which are applicable to all kinds of materials.

Referring to Fig. 1, we have seen that, in a beam supported at the ends and loaded in the middle, the same strains are produced in it by a weight W , as if it were fixed at the points W and A , and loaded with half the weight W at the end B . In the first case the effective length is that from A to B ; in the second only half that length, or from W to B .

So that when a beam is fixed at one end and loaded at the other, its load to produce a given strain will be, in respect of length, one-half of AB , and in respect of weight or pressure, one-half of W , and $(\frac{1}{2} \times \frac{1}{2} =) \frac{1}{4}$ of the weight W , applied at the end of a beam of the length AB , produces the same strain in it as the weight W does when applied in the middle.

From this it follows that to ascertain the strain on the top or bottom of a beam from any given central load, that load must be multiplied into the length of the beam, and the product divided by four times its depth; and to ascertain the same strain from any given load uniformly distributed, the load must be multiplied into the length of the beam and the product divided by eight times its depth; or to put the case shortly, if l = the length, d = the depth, w = the weight, or load, the strain at the top or bottom of a beam when loaded in the middle of the span, will be $= \frac{lw}{4d}$, and when it is loaded uniformly over the length, the strain will be $= \frac{lw}{8d}$.

These are the strains at the centre of the beam. They diminish towards each end in the following manner. When the load is central, the strains diminish regularly, foot by foot, until they are reduced to nothing at the points of support; but when the load is uniformly distributed, the diminution is not regular, but in the ratio of the square of half the length of the beam to the multiple of the segments into which the beam is divided at the several points of loading, and in this way it is found that if a beam be loaded at ten equidistant points, the strain diminishes

from the centre, where it may be represented by 1, towards each end thus: At the first point on each side of the centre it is .96; at the second point, .84; at the third, .64; at the fourth, .36; and at the end, 0. Beams of iron are often made to vary in their dimensions in this way, so as to save material and yet preserve an equal strain in all parts; but for timber beams it is practically of no importance, and the central dimension is taken as that for the whole beam.

These are the theoretical strains produced in beams, but to derive practical calculations of the dimensions proper in any given case, it is necessary to have recourse to the results of experiments on the strength of the particular kind of timber intended to be used, which will be given in a future number.

THE ROYAL ARCHEOLOGICAL SOCIETY AT CARDIFF.

(FROM OUR OWN CORRESPONDENT.)

THE meeting of the Royal Archaeological Institute of Great Britain and Ireland has this year, for the first time, been held beyond the boundaries of England proper, and Wales has been the fortunate principality, and Cardiff the locality, that has benefited by this innovation upon hitherto established usage.

Thus even archaeologists are compelled by force of circumstances to yield to the blandishments of reform. The success of this experiment has, however, been such as to carry with it absolute for any supposed transgression of rules less stringent than those of the Medes and Persians. The welcome extended to this society on their incursion into the region of the Cymri, has been of the most hearty and enthusiastic description. The richness of the district selected upon this occasion is most tempting, and the programme of the tour that had been arranged could not fail to attract many visitors, as well as members of the society. The field, however, in which these ardent inquirers proposed to labour was by no means an untrodden one; for the Cambrian Archaeological Society has for many years done good work and service therein, and probably it has been the renown gained by those pioneers that induced the Royal Archaeological Society to follow in their steps.

The inaugural meeting was held in the Town Hall of Cardiff on Tuesday, July 25, when the President of the Society—Lord Talbot de Malahide—occupied the chair, and made a few preliminary remarks. The Mayor of Cardiff, Mr. C. W. David, then read a short address from the Corporation, and spoke of the gratification felt by themselves and the inhabitants generally at the visit of the society and the selection of their town as its head-quarters during its operations.

The President, on behalf of the society, said that he received this address with pleasure, as a testimony in favour of the work they had carried on, and the study which they made their speciality.

The President then introduced the Marquis of Bute who filled the office of president of the meeting, remarking that he was too well known in that locality to need that he should dilate upon his ability and qualifications, and that he surrendered the chair to him with pleasure.

The Marquis of Bute having addressed the company, all adjourned to an entertainment given in the Drill Hall of the town. From the Drill Hall the party proceeded to the precincts of the Castle, to commence their archaeological labours.

Here, according to the programme, Mr. S. T. CLARK, of Dowlais, declared by Mr. Parker to be the most competent authority upon the subject of castles, gave a description of the structure. He pointed out that it consisted of a vast inclosure, with earthworks upon three sides, and which, by its rectangular form, was probably of Roman origin; on the fourth side it was left open towards the town, as was frequently the case. Remains of a Roman hypocaust attested its antiquity. It was a camp or station on the main Roman road, which extended to S. David's. Within the inclosure there was another circular earthwork or mound with a table top, of quite another character, and of a different and earlier date. It resembled a class common in Normandy, and of which there are no fewer than 200 examples in England. At Sarum, for instance, there is a round mound connected with earthworks of its own age, and at Leicester another connected with rectangular ones. It is, therefore, only accidental that this should be connected with Roman works. There are several kinds of mounds—1. Judicial; 2. Sepulchral; and 3.

Military, and these have not become confounded even in their popular names. The Normans found these mounds ready to hand, and no doubt, upon them the fabric of a Saxon thane's aula, such as that seen in the Bayeux tapestry, a wooden erection surrounded by a ditch, with warriors attempting to set it on fire. Fitzhamon thus found this mound, and occupied it, and his successors defended themselves by building a wall around it, 10 or 11 ft. thick and 40 ft. high. Other of the Norman nobles built another wall across the inclosure and mound, dividing the space into an inner and outer bailey, with some drum towers attached to their cross wall, and the hollow shell of masonry forming the keep was built upon the mound and cross wall. There was no other masonry than this shell, any other divisions and roofings having been of timber, and they have long since vanished, leaving only the holes into which the beams were inserted, and some few corbels to support the plates. Subsequently the De Clares, a powerful family, needing further accommodation, built part of the Castle buildings within the inner bailey. After the De Clares came the De Spencers, who probably added the octagonal tower which now forms the principal feature of the present structure. They also added a sort of portal tower to the keep, which still projects from that shell. Beauchamp built afterwards a fine hall, with a crypt beneath, and added at least two of the oriel turrets which now project from the entrance façade of the Castle, and his arms are to be found upon a boss of the vaulting. To the structure as he left it many modern additions have been made. The outer bailey, left open to the town, had a shire hall, and here also were lodgings for the feudatory knight, whose duty it was to defend the Castle.

Mr. PARKER, in thanking Mr. Clark for his discourse, pleaded for the preservation of all such interesting earthworks, citing many which to his knowledge had been most wantonly destroyed, and suggested that proper lists should be made and kept of all that still existed.

After the party had carefully inspected the remains of the ancient works thus described, a large number visited with interest the very important additions now being made to the Castle by the Marquis, from the designs, and under the direction of Mr. Burges, as architect. These, however, are at present so far unfinished and encumbered with scaffolding that it is not fair to judge yet of their general effect, as we shall hope to do at a future time. They also can hardly be said to come within the scope of antiquarian study. It is satisfactory that nothing of ancient work of any interest has been destroyed to make room for them. It is, of course, open to criticism as to whether they accord sufficiently with the ancient remains; for our part, we think that the work of modern architects should not affect such similarity to existing remains as to in any way be likely to become confounded with them. Another question which may fairly be raised is whether castellated architecture is not altogether undesirable in this nineteenth century, as it certainly does not express a want of the age; and smoking-rooms do not require walls of the thickness of a Norman keep. Into these questions, however, we shall not enter now, and it may suffice to say that though everything is open to criticism, judged by its own merits alone, there can be no doubt as to the high ability and great knowledge displayed by the work in many ways; and it is much to be thankful for that any architect of the present day of such marked and special character as our friend Mr. Burges is, should have had such an opportunity of carrying out his favourite ideas without stint or restraint; and we doubt not that the result will be in every way worthy of him, and that he will not fear to abide by such result. It will be for public opinion hereafter to declare how far it accords with the taste and requirements of the age.

In the evening the Marquis held a reception at the Castle, which was very numerous attended by the members of the society, and other persons in the neighbourhood, and visitors who had received special invitations.

On Wednesday, July 27, Mr. E. A. FREEMAN opened the historical section by one of the most eloquent, heart-stirring, and well-delivered addresses it has ever been our good fortune to hear. After pointing out the distinction between profitable and unprofitable antiquarian pursuits, he stated that the business of the Society was history, specially local, but viewed in relation to history on its widest scale. Meeting each year in a different neighbourhood, they had the best opportunity of comparing the antiquities of various places. He then recalled the famous cities and the deeds of the famous men in the several localities that had been visited during the

twenty-seven years of the Society's existence. Exeter, however, had strangely hitherto escaped their notice, an omission he hoped they would soon rectify. He then defended the step they had this year taken of stepping beyond the boundary of England, and claimed as British ground far beyond the present limits of England to the North, and even included Edinburgh. In Wales English names were scarce, and yet such as "Welsh S. Donat's" gave food for thought, and pointed to the existence of some other S. Donat that was not Welsh. Cowbridge and others, again, are purely English. This was one proof of the district having been occupied by others than Britons as settlers. It was a question as to who were the first inhabitants of this country, and whether the Gaels had preceded the Cymri or not? There were some evidences which pointed to their having done so; but even the authority of Tacitus and Professor Huxley would, he thought, fail to convince that the Silurians were akin to the Iberians of Spain or of the Turanian stock. As a marked distinction between Ireland and Wales, he said the latter could show no masonry monuments earlier than the Roman Invasion. The Briton remains still in speech and in person, but the Roman has vanished, though some of his works in the shape of camps and earthworks are still extant. The devout Norman, however, had founded churches and monasteries in profusion, though from the circumstance of his occupation they necessarily partook of a defensive character, and the chartered towns betrayed that their occupants had been of various races clustered together for protection against the indomitable natives, and occasional settlements of Flemings had added to the interesting problems of the country they were in. The days of the wars and contention of all these races were now happily passed, and their several descendants met in peace to discuss and examine at leisure what had been wrought in times long gone by.

Mr. BURTT then read a learned paper by Mr. Floyd, on the "Conquest of South Wales." In this he received opinion as to the conquest of Wales by Fitzhamon and his twelve knights as private adventurers was disputed, and instead it was advanced that the whole of that country was subdued, it might be only temporarily, in A.D. 1093 by William Rufus, who then appointed those officers, and that their offices were not, of right, hereditary.

This paper Mr. CLARK thought might prove a new era in the inquiries on the subject of which it treated, and that Mr. Floyd's arguments, based on documentary evidence, deserved the fullest consideration; and the Chairman admitted that, though its substance was startling to him, Mr. Floyd had prosecuted his researches in the right way.

The Rev. W. J. LOFTIE then read his paper on the Lords of Cardiff—professedly a summary, and without doubt a convenient one, of their history as already written.

The members of the society then set out for Llandaff, and were hospitably entertained at luncheon by the Lord Bishop of the Diocese at Bishop's Court.

They were afterwards conducted to see the cathedral by Mr. E. A. FREEMAN, who delivered a discourse upon it. He pointed out the absence of transepts and a central tower, features usual in most cathedrals, but it had two western towers. The nave and choir were undivided, but an archway separated the presbytery from the latter, and an elegant lady chapel projected further eastward, and a square chapter-house from the south chancel aisle. A few years ago the building which they now saw nearly complete was partly a roofless ruin and partly worse still. It was the greatest change that had ever taken place in any part of the kingdom, and the restoration on the whole did the greatest credit to all parties concerned. He still longed to see a high roof upon the lady chapel, which it still sadly needed. Mr. Prichard recommended a hipped one. Doubtless, the origin of the cathedral was a small church built by Bishop Urban in 1123, but the greater part of the structure was of the thirteenth century, with additions of the fourteenth and fifteenth. The west front of the nave, both inside and outside, he considered one of the most perfect compositions in the lovely Early English style of architecture, and the round-arched western doorway, with its curious pendant key-stone, was unique. The northern tower had a crown of perforated parapets and pinnacles, lately restored by Mr. Prichard, somewhat resembling that of St. John's Church, Cardiff, of the type more common on the Somersetshire side of the Bristol Channel. The southern tower, which had been destroyed, had been rebuilt in a dissimilar manner to the other and finished with a spire, and he approved of this dissimilarity, but not of the design adopted, which looked as if it had swam across the Channel from Normandy, and dropped all its stringcourses on the

way. Proceeding to the interior, he said that its present condition was an example of what a cathedral church should be, as Wells was of what one should not be—a place for the people to worship in, and not merely kept for show. The only thing that he regretted was that the architect had removed the old reredos and substituted a new one, which was more like one of the canopied tombs in Westminster Abbey.

Mr. PRICHARD, the architect, then gave his reasons for having done so, as follows:—1. That it was so dilapidated that it could not have been left as it was in the midst of a restored cathedral. 2. That its removal was a necessity to enable the fine Norman arch of separation between the presbytery and the lady chapel to be restored. 3. That though it was known the old reredos had been surmounted by several most elaborate ranges of canopies and pinnacles, there were no remains of these left from which they could be reconstructed, and therefore any restoration must have been entirely conjectural; and, 4, that if there had been, the cost would have been beyond the means at the disposal of the chapter; and further that the style of art of the old reredos—Late Perpendicular—was not good enough to render such an expenditure desirable, even if practicable. But though he had substituted another design, which of course was open to criticism, he had kept the old one, so that every one could see what it had been, and reconstruct it in imagination as he pleased. His former partner, Mr. Seddon, had also had a liberal offer from Mr. Rossetti to paint the reredos which they saw at a moderate price, and this to a certain extent caused the design as executed to be adhered to.

Mr. FREEMAN said his opinion was not shaken, but he went on to remark upon the improvement lately effected by the extension of the choir to its full original limits.

After the cathedral had been fully inspected by the assembled party, they adjourned to the Deanery, and partook of refreshments kindly provided by the Dean.

In the evening a public dinner took place at the Cardiff Arms, under the presidency of the Marquis of Bute, and this concluded the second day's proceedings of the society.

On Thursday morning the architectural section met under the presidency of Lord Talbot de Malahide, when a paper by the Rev. W. Evans on Caerphilly Castle was read, and one by the Mayor of Cardiff, upon Charles I.'s visit to Cardiff.

A numerous body of the members and visitors then proceeded to Caerphilly, where they were entertained in a princely style by the Marquis of Bute, in the great hall of the castle, which had been temporarily roofed over for the purpose by Mr. McConochie. The roof was low pitched, as it is said, according to evidences found as to the pitch of the original roof.

After luncheon, Mr. G. T. CLARK, of Dowlais (addressing the Marquis as "My Lord of Caerphilly"), said it was upwards of 500 years since any such assembly could have occupied that apartment. In 1326, however, Hugh de Spencer received here his king Edward II., in a befitting manner. That vacillating monarch, however, fled from the attack on the castle prepared by his queen and princes, and De Spencer came to terms with his enemy. The castle afterwards passed into the hands of the Beauchamps, the Warwicks, and the Nevilles, who naturally neglected it in comparison with their other greater possessions, and thus it fell into decay without having witnessed any historical events of special note. The site of Caerphilly Castle was chosen because the Norman invaders, marching from Gloucester along the sea-shore, came down the valleys from the North, and getting hold of the strip of moderately fertile land, tried to keep it by placing castles in every manor, and here were the great gorges of the Taff, the Rumney, and the Nant glade, and here was the triangle through which the Welsh could pour down on them. The base of the triangle was strong, and the object of the Normans to cut off the retreat of the Welsh; therefore they placed the Castle of Caerphilly where it is. It was built in the reign of Henry III., but contains work of later periods. Its site is the largest except that of Windsor Castle. It presents a vast extended front, and flank walls with gateways and towers, but was undefended at the back, which was low and swampy ground, with the exception of one isolated hill, which of course was occupied by the defenders, as it would otherwise have commanded the castle. It stood rather in a lake than within an ordinary moat, and the lake was divided into inner and outer by a narrow tongue of land. The central portion of the castle itself was on an island, and had noble gateways, almost unrivalled anywhere, and angular circular towers; and the great

hall stood within their inclosure, a splendid work with all the usual appurtenances, and a vaulted kitchen with a private one for the lord over it. Very curious arrangements for broiling and boiling, and preserving the wood ashes for cleansing, with ventilation flues, were subsequently minutely explained by Mr. Octavius Morgan.

In the evening a *conversazione* was held in the museum that had been formed for the occasion in the Town Hall, and Mr. Seddon explained a drawing contributed by him of a most elaborate and interesting screen in Llangwm Church, Monmouthshire, and this concluded the operations of the third day.

On Friday the members started from Cardiff at 10.5 a.m., accompanied by the Mayor. On arriving at Portskewett the whole of the visitors alighted, and after walking a short distance were taken up by a train of breaks and coaches and conveyed to Caldicot. Here the first object of interest was the Old Church, which was visited by a large number of the party. The church was highly interesting, both on account of its architectural exterior and the complete ecclesiastical arrangements of the interior.

The party then proceeded to the ancient and historical castle of Caldicot, which is only a short distance from the church just referred to. The castle possesses, as is well known, many points of interest, but the anticipations of the visitors were rather disappointed, owing to the absence of Mr. Octavius Morgan, M.P., who is known to be a great authority in respect of the antiquities of that locality, and they had made up their minds for a treat in the shape of a detailed description and explanation of the ancient castle from that gentleman. Mr. Morgan was, however, absent for urgent reasons, and after a little delay,

Mr. J. P. SEDDON, architect, in compliance with numerous requests, gave as complete a description as he could, on so sudden a request, of the remains of the castle. Taking up his position in the north-east corner of the quadrangle of the ancient ruins, he said they stood then near the entrance gateway of the inclosure. Opposite to them was the postern gateway, which was in the round tower of the keep of the castle, the architecture of which was of the twelfth century. On the left-hand side was the curtain wall, in which was the entrance tower to the bailey, and, in description of this, he read notes by Mr. O. Morgan, M.P. The circular tower marked D in the notes was of the same class as the keep tower. It appeared to him that the main range of the walls now extant were buildings appended to the tower, and of a later date, as they corresponded with what they had seen at Caerphilly Castle. The entrance gate seemed to be the base work of the castle. It was built of ashlar, unusually large for the South Wales castles—to his mind, the stones were rather too large. The windows of the north-east tower seemed to have been canopied, and the work altogether, especially the chimney shaft, was of a very peculiar and superior description. He regretted to say that his knowledge of the ruins was by no means extensive, and as he had not before seen them, he thought they would do better by going round and inspecting the various points for themselves. He could not help remarking that he thought the keep tower was of a much earlier period than the other portion of the castle, and that it had been worked into the building. Looking at the south-east drum tower, he had no doubt that it had been the principal portion of the residence. The chimney shaft was a very fine one, bold and full of character, and such as they did not see in other castles of South Wales. The round tower at the postern gate he believed to be of the twelfth century, the other portions of the ruined structure being of the Edwardian period. The decayed drum tower on the west side he believed to be the means of egress from the castle. Two foundations were found in the south-west angle, one of which was, in all probability, the castle well.

At about 12.30 p.m. the train of breaks was again in motion, and, after a very pleasant drive, the ancient village of Caerwent was reached, where the party again alighted, and proceeded to view the old church, in which numerous Roman features are discernible. As the doors of the edifice were not open, however, the party proceeded to view the noted remains of the old Roman city. The Roman baths, discovered about fifteen years ago by the local Antiquarian Society, were of especial interest. Through some neglect, however, the general outlines of the walls were overgrown with tufts of grass, and the pains taken by the Antiquarian Society seemed to have been entirely obliterated. The visitors were, however, indebted to the Rev. Mr. Steele, the vicar of the parish, and Mr. Seddon for numerous lucid remarks on the formation of the baths. The remains of a Roman

villa, and the Roman wall inclosing the "city," were also closely examined. A breach in the wall attracted considerable attention, and some discussion ensued as to whether the wall was purely Roman. Mr. Seddon said the stringcourse was built of sandstone, the heart was constructed herring-bone wise, and the face of the wall, which was built of much larger stones, appeared to him to be more Anglo-Saxon than Roman. Mr. Bloxam, however, said the wall was beyond all doubt purely Roman. The wall was said to inclose a circumference of one mile, and the city comprised an area of 500 yards by 400 yards. Formerly the sea had washed up under the walls, and traces of this fact were still to be seen. It was stated that a Roman font had been found within the walls of the city, and that it was to be seen in the garden of a churchwarden of the parish. A large number of the visitors repaired to see the ancient relic, but the conclusion came to was that it was a portion of a series of columns, and not a font.

After another very agreeable drive of about an hour's duration, the party arrived at the ancient town of Chepstow, where they partook of luncheon.

Subsequently, the famous remains of Chepstow Castle were visited, and the sight was very interesting. For the want of some one, however, thoroughly conversant with the history of the ancient remains, the remarks made by the visitors were on the whole simply speculative. Some of the party subsequently paid a visit to Tintern, but the greater portion returned to Cardiff by the 4.30 p.m. train leaving Chepstow.

On Saturday, the members of the society and visitors amounting to above a hundred went by rail to Cowbridge and thence by carriages to Beaupré, a ruined mansion, with some portion dating from the Decorated period of English architecture, but mainly of the Elizabethan and Jacobite style, of the latter of which the porch inside the courtyard is a rich and well-proportioned example. This was explained by Mr. Parker. At Llantwit, the curious double church, one supposed to be monastic and the other parochial, present some most interesting problems. Mr. Freeman conducted the party over it, and called especial attention to the fine and perfect stone reredos, and a niche of elaborate Early English character, with trefoiled arched head and obtuse pediment. The jambs were richly carved with foliage, into which were introduced the heads of kings and queens; a panel built into the wall outside had the figure of Jesse, apparently of still earlier date. In and around the church are numerous monuments, and the trunk of a churchyard cross of elaborate interlaced Celtic ornament. The same character of design was also imitated on other monuments, both of the fourteenth century and of a comparatively modern date. These were described by Mr. Bloxam.

The next point of rendezvous was S. Donat's Castle, the residence of Dr. Carne, who had provided in its ancient hall refreshments for the party. The Castle is notable for its charming situation near the sea, and for its perfect condition as an old fortified manor house. The entrance gateways are far older, and one of them contains a good thirteenth-century fireplace, and cleverly-contrived arrangement of angle windows. The hall retains all its old features intact, and though some parts have been slightly modernised, the general effect is uninjured. In a dell beneath the castle is the parish church, of the usual local semi-fortified type, and the churchyard contains its cross, or rather Calvary, almost perfect, with a sculptured crucifixion, surmounting a slender stone shaft, resting upon a fine flight of steps. The chancel arch has engaged columns of Late Norman work.

At Ewenny Abbey, as it is called, the last place visited, the remains of the fortified priory are extensive and interesting. The church has a Norman nave with a massive arcade on one side only. The aisle to which it gave access has been destroyed, with one bay of the nave. There is a central tower, the western arch of which is filled in by a wall with a doorway on either side of the altar space, forming as Mr. Freeman explained, a simple reredos to the western or parochial church, and separating it from the eastern part, reserved for the monastic community. One transept remains, with part of the two chapels which projected eastward from it. The chancel is remarkable as one of the very few vaulted Norman buildings left to us; it is covered with hand vaulting on ribs, excepting the easternmost bay, which is groined. The doorway to the cloisters of rich Norman work remains, and two fine gateways to the abbey of Early English, and a large portion of the curtain walls and a pigeon house of the same date. At Ewenny, Major Turhervill had, provided a sumptuous repast, so that the labours of this day and of the week were pleasantly concluded, thanks

to his hospitality, and the party reached Bridgend in the evening, and returned by rail to Cardiff.

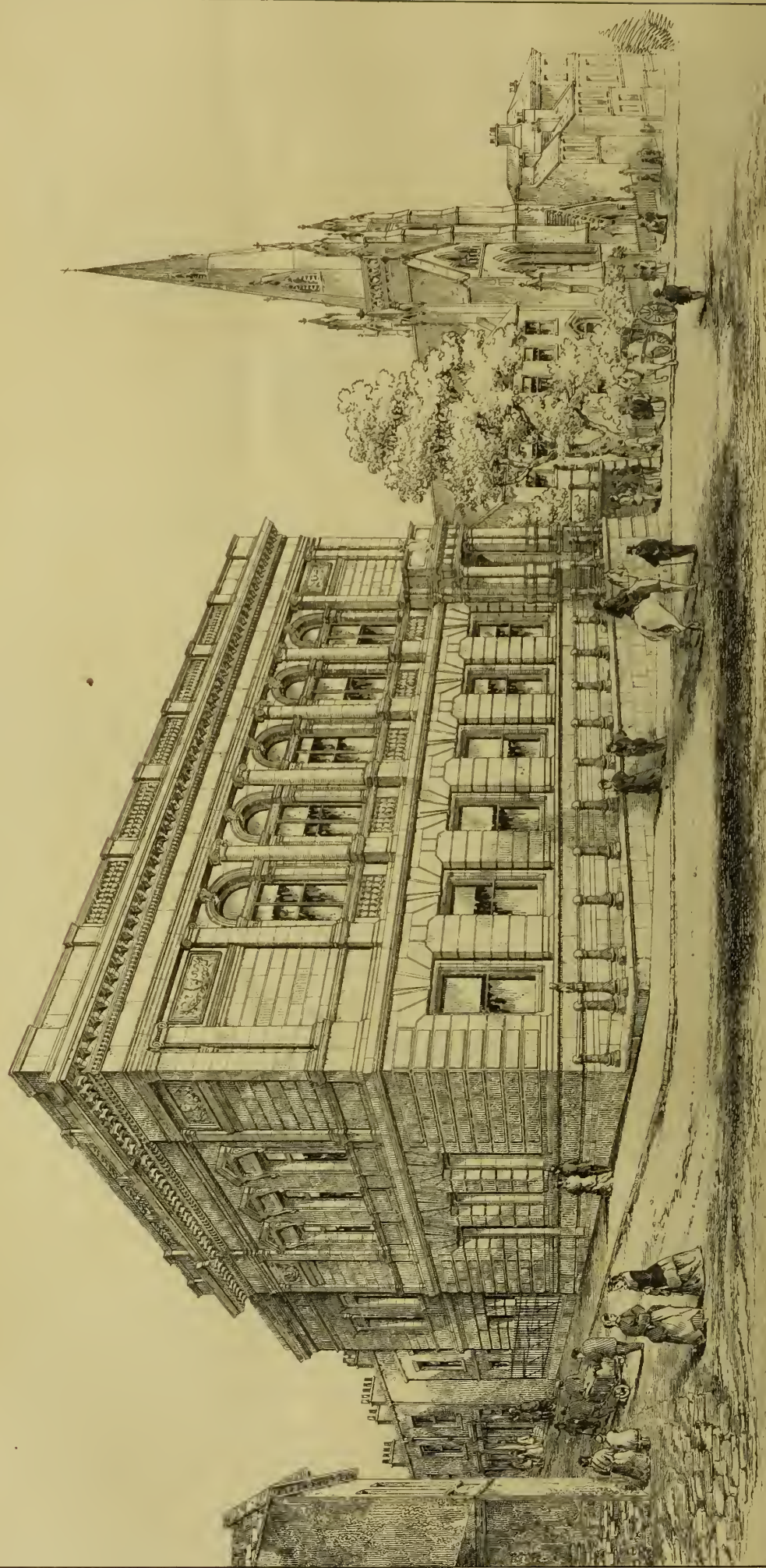
On Monday a very large party went over the ground assigned to the day—viz., Caerleon and Raglan. The party started from Cardiff about half-past nine, and on reaching Newport carriages were waiting to convey the ladies and gentlemen to Caerleon. The chief objects of attraction were the Museum, the Mound, and Arthur's Round Table. Mr. J. E. Lee and Mr. R. F. Woollett, both of whom are connected with the properties where the antiquities were to be seen, kindly accompanied the party, and gave every explanation in their power of the several objects of interest. Mr. Lee invited the visitors to the Priory, and there dispensed his hospitality in a very admirable manner. The party then returned to Newport, where a special train was in readiness to convey them to Raglan Castle.

The concluding meeting was held on Tuesday at the Nisi Prius Court of the Town Hall, Cardiff. In the morning a meeting of the historical section was held in the court, but the attendance was very limited, many of the members having left the town. The first paper read was by Mr. Floyd on the Ilarvey and Stradling families, two well-known families in the county. This was followed by a paper by Mr. G. T. Clark on the historic monuments of Glamorgan-shire. There were very few objects of interest in the county, especially royal monuments, about which some time since, by a commission from the Society of Antiquaries, he was requested to make a report. He, however, briefly noticed the principal churches in which such monuments were to be found. Mr. Octavius Morgan, M.P., also alluded to the monuments in Monmouthshire. A general meeting was then held to conclude the business of the meeting at Cardiff.

THE COUNTY COURT, BARNSELY.

THE Midland Railway Company having made a branch line from Cudworth to Barnsley, arranged to take the old county court as their station; a new court has therefore been erected about two hundred yards higher up Regent-street, mainly at the expense of the company, under the direction of Mr. Thomas Charles Sorby, of London, acting as architect to the Lords Commissioners of Her Majesty's Treasury. The principal entrance is from Regent-street, by a portico and flight of sixteen steps, 12ft. wide. On the ground floor is the public office, 32ft. by 34ft., by 13ft. high, with offices *en suite* for the Registrar, the bankruptcy department, and the bailiffs. On the first floor, approached by a flight of stone stairs, is the court about 46ft. by 35ft., and 23ft. high, fitted up in a very complete manner. The retiring-room for the judge is on the same level as the raised bench, and is about 19ft. long by 18ft., with lavatory and water-closet attached; this room is approached by a separate staircase from the private entrance in Eastgate. Retiring-rooms are also provided for the jury and counsel, and for females, with the requisite water-closets attached. A residence in the rear fronting Eastgate is also provided for the courtkeeper, consisting of living room, kitchen, scullery, &c., and three bed-rooms. The first is faced with Mr. Seal's Darfield stone, from the carboniferous sandstone formation. The principal internal joinery is in Stettin oak, the rest in deal, painted. The floors are constructed with fir joists, the interspaces being rough-boarded on fillets, and filled in the whole depth of the joists with concrete, surfaced in cement to receive kamptulicon, except in the passages and lobbies, &c., which are laid with tiles, manufactured by Mr. Whetstone, of Coalville, and in the private offices, which are finished with ordinary floor boards. The public office and court are warmed by stoves specially made by Messrs. Stuart and Smith, of Sheffield, the remainder of the rooms having open fireplaces. Extracting flues, fitted with mica valves to prevent back draught, are provided to most rooms, for ventilation. The court was to have been artificially lighted and ventilated by an improved sunlight, partially invented by the architect, and manufactured by Mr. Freeman, of Vine-street, Piccadilly, similar to several to be seen in the London county and police courts, as at Bloomsbury, Marylebone, &c., and in all of the more recent county courts, but the sunlight now going to be supplied (when all the works are quite complete) will be a cheap substitute, designed by the Office of Works, of which time will test the efficiency. The works generally have been executed by Messrs. Nicholson, of South Brooke-street, Leeds, the duties of clerk of works having been efficiently fulfilled by Mr. R. Bethell. The cast iron railing is the work of the Coalbrookdale Company, and the gas fittings, except the sunlight, have been supplied by Mr. Freeman.

THOS. CHAS. SORBY.



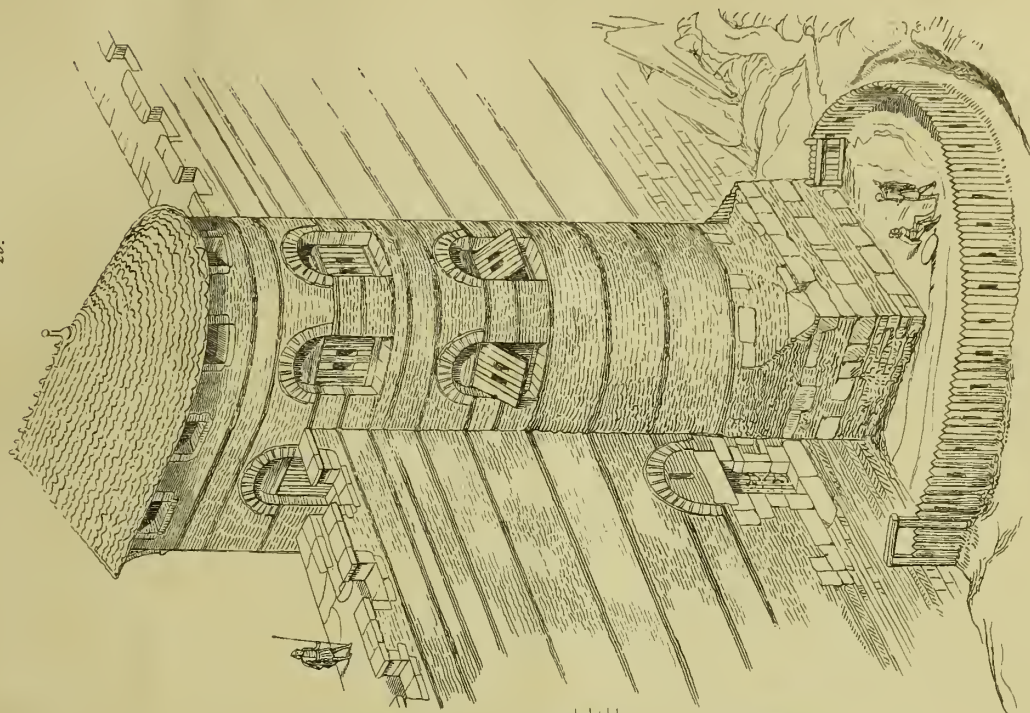
THE COUNTY COURT, BARNSELEY.

T. C. SORBY, ARCHITECT.

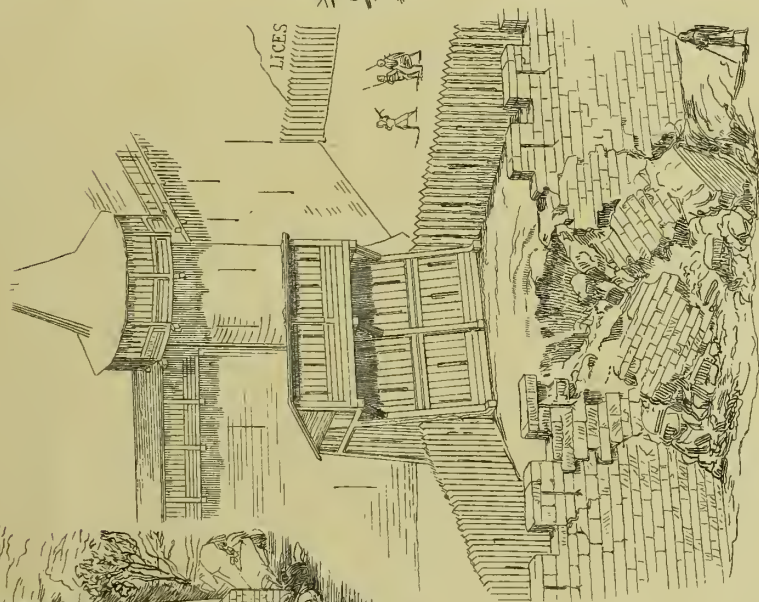
DETAILS

FROM VIOLET-LE-DUC, 'DICTIONNAIRE RAISONNÉ L'ARCHITECTURE.'

29.



30.



28.



ALBERTIA.—III.

THE disposition of the limited space allotted to the purposes of the International Exhibition is so fraught with inconvenience, and ever-recurring shifts and expedients, as to almost necessarily lead to the conviction that the whole thing has been got up in haste, and as a temporary arrangement only. We will not speak of the external aspect of the premises, which on the three only sides at which the boundary walls are visible—viz., the Exhibition-road, the Albert-road, and Cromwell-road, present features of disorder and obtrusive ugliness which are a positive offence to the eyes of neighbours and passers-by. On each of those sides is an entrance door, but an inspection of the plan will show that each of these entrances opens only upon secondary sections of the Exhibition, without any direct bearing upon the general scheme; the consequence of which has been that we have heard of not a few cases where unfortunate visitors, entering by one or other of these approaches, have not been able to navigate their way beyond the mazes of the machinery in motion department on the western side, or the pipe-making machinery on the eastern, and have to content themselves eventually by taking refuge in the refreshment-rooms on the south. This untoward result, which at first would seem difficult to conceive in a so-called "public building," is easily accounted for when it is recollected that the entrances in question all lead to the basement floor, whilst the more attractive departments of Fine Arts and Manufactured Goods are on the floor above, the approaches and stairs to which are not very evident to strangers on a first or even a second visit. The obvious and proper entrance to the Exhibition would be from the Kensington-road, on the north, opposite the Albert Memorial; but here the ground has been taken up for the Albert Hall, ground which, if applied to the purposes of the Exhibition, in direct connection with the two side buildings, would have led to a tolerably satisfactory result as a whole. As it is, the greater portion of the visitors actually do enter the Exhibition from this point, when, after making their way through the dark lobbies outside the boxes of the Hall, and mounting to the first floor, they find themselves streaming into a gallery overlooking the conservatory of the Horticultural Gardens, whence, by branch and curved passages, tending right and left, and running on a decline, they are conducted to the upper floors of one or other of the Exhibition galleries proper. The course of experimental, hopeless wandering which then opens to the hapless explorer is almost beyond belief, and quite indescribable. Such turning to the right and to the left; such up and down stairs at frequent and ill-defined points along the route; and then the horrid chaos amidst the sheds in the southern section, which connect, or rather separate, the regions of the west from those of the east;—who shall consider these things, and look upon a day's excursion through the International Exhibition as a matter of pleasurable recreation or intellectual solace?

The contents of the Exhibition, in its various departments, have already been amply treated of in the columns of the BUILDING NEWS; our present purpose with it, therefore, will be chiefly as to the general principles of the design and management of the undertaking. Following upon, and avowedly an off-shoot of the Great Exhibition of 1851, it enjoys the *prestige* of high and illustrious parentage; but it stands under the disadvantage, also, of having to compete with the memories of an achievement, which, as it was unprecedented in its conditions and its scope of operations, must remain for a long course of time out of the range of all rivalry or imitation. The Great Exhibition of 1851 was a grand success; in the field it occupied, which was the whole territory of production and industry, it was the

event of a generation, perhaps of a century. But the very essence of its unparalleled success, and of its pleasurable and useful influence, was the vastness and the comprehensiveness of its scheme, all the industrial and commercial energies of the earth, as displayed in natural and in manufactured products, coming forward spontaneously to aid in the enrichment of its various departments. The expenditure of capital and labour involved in this result was such as could only be warranted by exceptional circumstances of commensurate magnitude and interest. The various nationalities from all corners of the earth—north, south, east, and west—which sent their representatives and their wares to take part in the World's Fair, could not reasonably be expected to repeat the exertion within any calculable period of time. The signal falling off of the Exhibition of 1862 as compared with that of 1851, in all that had invested it with special value and interest, as distinct and above ordinary bazaars and exhibitions, should have sufficed as a warning that an achievement which involved stupendous and wide-spread a combination of resources, and with such striking results, was not to be repeated in a decade, much less every year. The Royal Commissioners of the '51 Exhibition, however, when inaugurating their cherished scheme of a series of annual International Exhibitions seem to have ignored all such reflections as we have suggested, or they would never have ventured to speak of them as realising "the spirit in which the Exhibition of 1851 had been conceived." The distinguishing characteristic of the '51 Exhibition, resulting from the spirit in which it was conceived, was its cosmopolitanism, its universality—the very elements of which, owing to circumstances we have indicated, are remarkably deficient in the present display, and will probably become more and more so in future years. The Royal Commissioners may flatter themselves, in carrying out an ambitious theory, by calling their enterprise an "International" Exhibition; but what prospect is there of receiving contributions from foreign nations in such amount and of such quality as to warrant the use of the title? The Exhibition of 1851 attracted, in round numbers, fourteen thousand contributors (exclusive of India), of whom upwards of six thousand five hundred were foreigners; the Exhibition of 1871 boasts in all some two thousand exhibitors (including the departments of painting and other branches of the Fine Arts which were not comprised in the scheme of 1851), and of these the bulk are British, the foreign exhibitors being limited to some couple of hundred or so. Further, the contributions of foreigners (with the exception of works of fine art) are of a very miscellaneous character and secondary importance, as "Educational Works and Appliances," "Specimens of School Work," "Scientific Inventions and New Discoveries," on a small scale; with the addition of jewellery, and other articles of dress and luxury, which have been sent with purely trading objects, and in many of which the owners have been successful in driving a considerable business. In the two staples of pottery and woollen and worsted fabrics and materials, which were announced as the distinguishing industrial features of the present year's Exhibition, the supplies from abroad are remarkably few, particularly the latter, in consequence of which the Royal Commissioners have been at the necessity of procuring, and exhibiting in their own corporate name, specimens from Prussia, Russia, Hungary, Bavaria, Switzerland, Saxony, Belgium, Holland, Italy, Spain, Portugal, Morocco, &c., which would otherwise have remained unrepresented. As an instance, the little paper entitled *The Key*, which is printed and published officially in the building, remarks upon "the absence of Russia from the countries taking a leading part in the exhibition" as a thing "to be regretted," adding that "with the exception of, perhaps,

two or three oil paintings, she is unrepresented in the Fine Arts Section. And, as regards the Industrial Section, a vase and ten pieces of woollen fabrics are the only tokens of Russia's *capabilities* to participate in the Exhibition." Upon this we will only remark that, considering the magnificent and interesting display which Russia made in 1851, the word "*capabilities*," which we have italicised, is hardly appropriate when surmising upon the probable causes of her absence on the present occasion. In another article in the same little paper it is angrily remarked:—"It would not be difficult to take many other countries similarly to task, and to point out how much their collections fall short of affording a due representation of their artistic and industrial status." The Official Reports on many of the departments, now in course of being issued, also make feeling mention of the too general abstention of foreign nations from participation in the advantages of this "International" Congress, which, in some cases they seek to account for as consequent upon the recent disastrous war. We suspect, however, that the circumstance may be more truly accounted for upon other grounds—grounds having to do, not only with the local conditions of the exhibition, and the *personnel* of its management, but with the obvious tendencies which the policy adopted by the latter seems likely to involve.

Supposing the opinion of the Commissioners and their various committees and advisers upon the merits and value of particular products to have any effect, for good or ill, upon the interests of their producers, the principle of selection laid down in the management of this "International" competition must be looked upon as a delicate and dangerous assumption of power, which may often work injustice, and the exercise of which, in the best and purest of hands, could never be wholly free from suspicion. With the exception of objects for which, by previous negotiation, space has already been guaranteed, all objects are to be sent, carriage paid, direct to the building, "for the inspection and approval of judges appointed for the purpose," and rejected articles are to be removed, also at the expense of the proprietors. One of the regulations states that "Prizes will not be given; but a certificate of his having obtained the *distinction of admission to the Exhibition* will be given to each exhibitor." We say again that, whatever may eventually be their power to realise their intentions, there is in all this a suggestion of interference and jobbery with the interests of industry which cannot but give rise to serious ungivings. We all recollect that, whatever the *éclat* and success which attended the Exhibition of 1851, simply as a display of industrial wealth, the awards and reports of the jurors were the occasion for bitter controversy, resulting in jealousies and heartburnings, accompanied by imputations of incompetency or unfairness, the memory of which has not yet died away. What, then, must be the results of a pretension, arrogated by the select clique which acts under the auspices of the Royal Commissioners of 1851, to adjudicate upon the merits of every man's labour and every man's wares, by giving or withholding "the distinction" of admission to the International Exhibition? Already we hear complaints of unfair dealing, or caprice, and occasional scoffing at the omniscient judgment of the authorities in these matters. On the one hand we have a professional complaining of the exclusion of a medicated bath, which he considers the greatest curative invention of the age; on the other we find the Commissioners charged with puerile instincts for admitting into "the Educational Section" a collection of dolls and other toys amongst "appliances for physical training." The learned writer in *The Key* is very oracular upon the latter subject, in reply to some "pompous" condemnatory observations of "an influential contemporary," and insists that toys are some-

thing more than mere playthings—that they are, in fact, an important educational adjunct. “Is it not,” he says, “reasonable to suppose that by a judicious selection of toys good qualities in children may be strengthened, and evil habits and dispositions weakened? As an evident example, to a quiet, timid, and retiring boy those playthings should be given which *tend to increase his self-assertion*, whilst the opposite description should be supplied to the unusually forward lad.” Confessing that this position is to us not so “evident” as the writer implies, we may remark as a rather singular circumstance that the educational world is indebted to one enterprising tradesman alone for contributions in this important educational department, whose exhibits, including dolls of all sizes and materials, some crying, others opening and shutting their eyes, dogs which “growl, and beg, move paws and head,” chirruping birds, dancing monkeys, Noah’s arks, and all sorts of games, represent eighty-two items in the catalogue.

As a whole, the contents of this first Exhibition, as well as their disposition and the arrangements connected with them, have much too obviously the air of the “shop” to entitle it to consideration as a national, much less an international, enterprise “for the encouragement of art and industry.”

OMICRON.

PARLIAMENTARY NOTES.

THE CHOLERA.—Mr. Hardy asked the Vice-President of the Council on Thursday week whether he had any information as to the approach of cholera, and whether he considered that there were now existing sufficient powers in the central and local governments of the country to protect the population from its ravages.—Mr. W. E. Forster said: As I only saw the question in the business paper this morning, I shall not be able to answer it so fully as I otherwise might. The latest information I have received on the subject is to the effect that cholera has for the last two years been in Russia, and since August of last year in S. Petersburg. Since April of this year it has been in Wilna and other western places; recently, it has increased in S. Petersburg, but not nearly so much there as some months ago, and the disease is said to have some diffusion in the western provinces of Russia. We need not assume that this bodes any immediate danger to this country. We have no knowledge of any cases in Germany, but I have requested the Foreign Office that special inquiry on this point may be made at Berlin, and that if cholera is or arises in Germany, returns about it may be systematically forwarded to us. While thus there is no reason for immediate alarm, or for any particular action of central authority, there is ample reason that local authorities should exert themselves in the removal of nuisances, and should watch with extreme care over the sources of water supply within their districts. Water companies should be mindful that the great disasters produced by cholera in this country have been due to their distribution of sewage-tainted water, and every care should be used by them in good time, to prevent the recurrence of any such mischief. Their customers, too, should watch them narrowly. Authorities and water companies, acting as advised, need not be afraid of wasting their trouble; for whether cholera comes or does not come, they will be preventing other diseases. The danger of cholera is one against which the central Government can do scarcely anything—not because the law gives insufficient jurisdiction, but because, from the nature of the case, everything depends on local action. The Medical Department has given to local authorities in systematic memoranda, and is constantly in various ways giving anew, the best information which it can afford in aid of the local exercise of sanitary powers.

POLLUTION OF RIVERS.—Colonel Learmonth on Monday asked the Secretary of State for the Home Department whether the report of the Royal Commission on the Pollution of Rivers, of which the late Sir William Denison was chairman, had been printed, and if so, whether it would be laid upon the table of the house this session.—Mr. Bruce said that three reports had been issued, and the commissioners were proceeding with their inquiries.

A Norman window formerly stood at the south-east end of Westminster Hall. What, asks the *Guardian*, has become of it? Has it been “restored” away, or is it only hidden by the wall facing? It was, or is, one of the few remains of the original hall of Rufus, and might be displayed without interfering too much with the unity of Richard’s building.

Building Intelligence.

CHURCHES AND CHAPELS.

BATHFORD.—For the past few months important works of restoration have been in progress in the parish church of this village, under the direction of Mr. Preeby, architect, of London, and the cost is estimated at about £1,620. The work consists of the rebuilding of the south aisle, the addition of a chancel aisle, the reupewing of the entire church, and the putting in of a new high-pitched roof to the nave. There will be no material change in the amount of accommodation provided. The work will be completed, it is anticipated, in November.

HADDENHAM.—The large Perpendicular church of Haddenham parish, near Cambridge, is about to undergo extensive restorations, at a cost of some £5,000, and will, in fact, be nearly rebuilt. The chancel is undertaken by the Ecclesiastical Commissioners, who employ Mr. E. Christian, while the parishioners have engaged the services of Mr. R. R. Rowe for the body of the building.

PROSPECT (BOWLING) NEW WESLEYAN CHAPEL.—Last week a new chapel, which has been built adjacent to Wakefield-road, Bowling, Yorkshire, was opened. The structure, designed by Messrs. Andrews & Pepper, architects, Bradford, is in the Italian style, and measures inside 78ft. by 49ft., with a height of 31ft. to the ceiling. There are galleries all round, and accommodation is found for about 800 people. Underneath is a good school-room for 500 Sunday scholars. The sides are plainly finished, but the front, surmounted by a pediment, is boldly and artistically designed, and presents an imposing aspect. Carving is introduced to advantage, and the elevation is good. The total cost will be about £4,600.

SOUTHPORT.—On Thursday week the memorial-stone of a new church in Eastbank-street, Southport, was laid. The church is to be dedicated to S. Andrew, and will be built in the style of the fourteenth century. It will accommodate 1,000 persons. The cost, exclusive of the site and fence walls, is estimated at £4,600, and the architects are Messrs. T. D. Barry & Sons, Liverpool.

TAUNTON.—Last week the memorial-stone of S. James’s Tower, Taunton, was laid. The new structure is to be an exact copy of the old one, which was considered to have been a very fine specimen of a Perpendicular tower, and, which probably dated from the latter part of the fifteenth century and the reign of Henry VII., and was probably erected before its sister tower of S. Mary’s. The height from the ground to the top of the battlements will be 105ft. and 116ft. to the top of the pinnacles; the size at base within the walls will be 14ft. square, the walls themselves being four-and-a-half feet thick. The lowest tender for the erection, that of Mr. R. Piller, was £3,072, which was accepted, and with architect’s commission, and payment to clerk of works, &c., the total cost will amount to £3,500. The architect is Mr. Spencer, of Hammett-street, Taunton.

BUILDINGS.

MOULSHAM.—New almshouses have recently been erected in the Roman-road, Moulsham, Essex, the gift of Mr. O. Copland. The houses have been constructed for eight inmates—viz., four on the ground and four on the first floor, and the accommodation is precisely the same on both floors. Each house contains a living room, 12ft. by 10ft.; bedroom, 12ft. by 10ft.; small scullery, water-closet, coal-place, eupboards, &c., water being laid on to each house over the sink. Two passages divide the houses below, and go direct across to the gardens and yards in the rear, and from these passages on either side spring separate staircases to the four upper houses, the apartments of each inmate being kept perfectly distinct. The building is of stock brickwork, with stepped gables and pointed arches, relieved with red and white bricks. The cost, exclusive of the site, has been £700. The works have been carried out by Mr. George Saltmarsh, builder, Moulsham, from designs by Mr. Charles Pertwee, architect, Chelmsford.

WISBECH.—The foundation-stone of the new buildings to be attached to the Wisbech Working Men’s Club and Institute was laid on the 20th ult. The erection of the new buildings has been undertaken by Mr. Girling, of Wisbech, for £845; Messrs. Adams & Son, of Wisbech, being the architects. The rooms which will be added to the Institute are a reading-room, a conversation-room, and a gymnasium on the ground floor; whilst the whole of the first floor will be a spacious lecture-room, 50ft. by 31ft. 6in., and 20ft. in height. The exterior is to be of neat brickwork, without ornamentation.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

NOTE.—In addition to our usual quota of illustrations this week, we give an illustrated title-page for Vol. XX. to accompany the Index published to-day. The title-page was designed by Mr. P. Auld, the designer of the title-page of the BUILDING NEWS “Sketch-Book.”

RECEIVED.—S. Wade & Co., Colville Brown, J. M. Dowell, C. C. C. Trask, P. & Son, J. D. M., R. W. & T., B. Son & H., A. B., O. W. D., B. N., A. McI., H. H., E. L. S., C. S., C. T. J., G. R. J., M. & Co., T. P. B. W., B. & Co., R. H., Malcolm Stark, jun., E. R., A. & C. H.

W. POTTER.—Photo. to hand.

A. & C. H.—The pamphlet to hand.

W. C.—Please send the drawing.

ERRATUM.—The word “subcellie” was printed error last week on p. 68 for “subsellie.”

Correspondence.

THE NEW NATIONAL GALLERY.

To the Editor of the BUILDING NEWS.

SIR,—Your correspondent “W. W.” is pleased to be facetious. Indeed, from certain evidences in the architectural press lately, I am inclined to think that he is about to settle down as the comic man of the profession, and in this case we must treat his efforts with a share of that indulgence which is always accorded to those who do their best to amuse us and to be funny. Having stated in my letter, which you were kind enough to publish last week, that my work for Mr. Layard (which must be regarded as a diagram of certain views on the subject of the National Gallery set forth in the pamphlet, and not as a finished architectural drawing, and still less, therefore, as an architectural composition) was published entirely without my knowledge or consent, it is almost needless for me to add that I am in nowise answerable for the prominence given to my name in the matter; nor can I, in the position in which I am placed, enlighten “W. W.” as to my share in the design, or give him the satisfaction of knowing how far his ingenious surmises are correct. Whether right or wrong, however, he argues from a false basis in submitting an Italian Renaissance design to the test of the “insipid correctness” of pure Grecian architecture with which he is doubtless chiefly familiar. “W. W.” tells us that the “eornice is entirely out of style.” What style, I should like to know? But, architecture apart, “W. W.” is, at any rate, good at irony, and I had rather bear my share of it than be “damned with his praise,” any day.—I am, &c.,

GILBERT R. REDGRAVE.

Kensington, August 1, 1871.

THE HOUSE CISTERN.

SIR,—I have read the attack upon cisterns made by the *Globe*, as quoted by you at page 27, but there is very little in it. Like many other things, cisterns are very useful and necessary when properly used, but their abuse does not militate against their use; salt and sugar are both useful and necessary, but too much in our soup and tea spoil both. A cistern which causes the water from it to be turbid, owing to it not being cleaned out, except “once in three years,” shows the slovenliness or laziness of the householder; if the dinner-dishes in use were only cleaned out once in three weeks, what like would they be? The fact of the matter is that in thousands of cases cisterns are not only useful, but are absolutely necessary, if a constant supply of water is required. In such cases, therefore, give the cistern fair play, by putting it in a proper position, and by protecting it properly—e.g., if put in the garret, cover it so as to keep dust out, and at the same time allow access to it, so that it may easily be cleaned out when necessary, and if the overflow pipe is connected with the drains, do not bend it down so as to form a “siphon,” as recommended at page 58, for the purpose of keeping away bad air, because if such is done it will not act at all when cistern is emptied, and, again, if once charged, it will act too much, and run the cistern empty! Consequently allow me to recommend the self-acting bell-trap at page 522, Vol. XX., which, not being patented, can be used by any one who chooses to make it. There is, however, a slight mistake in the

sketch, as given at page 522, as the innermost pipe (the 1½ in. one) should be down a little from the top. Even supposing the supply for culinary and drinking purposes was taken from the main direct, still cisterns are required for the water-closets and baths, &c. However, the great question is to whether or not a proper and constant supply can be given to every part of a town or city, must of course depend upon the capacity and height of the "fountain-head." If such be both large enough and high enough, then it is better to have the water for culinary and drinking purposes—the latter especially—direct from the main; when, by using screw-down taps and strong pipes, needless waste may easily be prevented, especially if proper supervision be given to the repairing of the taps, &c., when they go wrong. To assert, as the *Globe* does, that "Taps do not break down or pipes burst is simply nonsense, as I find pipes bursting often, and taps "breaking down," or leaking continually, only if they are repaired in a reasonable time, little waste need occur from them, but if taps are allowed to go on leaking for months, the result may be the loss of millions of gallons daily, but such loss, under the circumstances, is the result of official neglect, and could easily be prevented. It often happens, however, that while the lower parts of a town can be constantly supplied from the main, the higher portions cannot, therefore cisterns must be put in for them, and although for drinking in summer the water may not be so cool as from the main direct, yet, if the cistern be properly situated or looked after, the water from it is just as good as that from the main.

I must here say a word anent the practice of our architects in this matter. They seem to think that any odd corner in a house, no matter where, is good enough and quite appropriate for the bath-room, &c. Now that is wrong. The bath-room and water-closet should never be put in the centre of the house and above the principal rooms, as is so often done, but towards the back, and away from these as much as possible; also let it have as much light and air as possible. A little attention given to these matters often makes the difference between a comfortable and an uncomfortable house.—I am, &c.,

PLUMBER.

SELENITIC MORTAR.

SIR,—Colonel Scott's experiments are undoubtedly of great value, as detailed in the *BUILDING NEWS* of July 7th, but it appears to me questionable whether there is sufficient novelty in his process to justify a patent. In a paper on "Artificial Stone," read by Professor Kerr at the Institute of British Architects, he introduced the invention of Mr. Westmacott for forming artificial stone and the preparation of mortar, which is much the same thing as Colonel Scott's process. "Take," says Professor Kerr, "common lime and sand, like mortar, and add thereto a certain proportion of the uncalcined carbonate, for the mere supply of the carbonic acid, and we have a perfect imitation of natural stone, a calcareous sandstone." The basis of both Mr. Westmacott's and Colonel Scott's inventions is the same—induration by the aid of carbonic acid.

A prior patent appears also to exist for something of the same kind—Ellis's, dated 1857.—I am, &c.,

P. E. M.

"THE IRISH BUILDER."

SIR,—A paper called the *Irish Builder*, which begs, borrows, or steals a large portion of its contents, has reproduced in its last number the whole of the article on "Amateur Planning" from the *BUILDING NEWS*, without acknowledgment. The editor of the *Irish Builder* must be foolish as well as dishonest, as he must be aware that the *BUILDING NEWS* is rather extensively taken in in Ireland. Perhaps if you would insert this notification in some prominent part of your paper you will put a stop, as far as you are concerned, to such a questionable practice.—I am, &c.,

AN IRISH BUILDER.

[We have had before now to rebuke this local journal for its "questionable practice," and we know of another London journal—the *ENGLISH MECHANIC*—which has had to do likewise.—ED.]

A PARK AT SALTIAIRE.—A park of fourteen acres, laid out in an ornamental manner, has just been dedicated by the owner of Saltiaire, Sir Titus Salt, to the use of the inhabitants of that town. The ceremony was performed on Tuesday week in the presence of a large concourse of the inhabitants. The park includes a cricket ground of five acres, a bowling green and croquet ground, and a noble terrace, reaching the full length of the park, is a striking feature.

Intercommunication.

QUESTIONS.

[2274].—**Church Building.**—I take the liberty to forward you the following questions for insertion in your paper, if you think the answers will add to the knowledge already possessed by the junior readers of your valuable journal. (1) In a church roof with circular ribs or principals (which alone are seen below the boarding), what pressure is there against the walls, and how may that pressure be prevented? (2) In the elaborate fan tracery vaultings, how is thrust calculated? (3) How is depth of each groin-rib found in the above cases? (4) Does there exist any rule to proportion plan of church? (5) Can any one explain, by diagram, the following, which is to be found in *BUILDING NEWS* of April 28, 1865 (article on towers and spires), where the writer says "it is called the rule of the triangle by which the elevation is determined by equilateral triangles, the sides of which are commensurate with the diameter of the plan or its parts—e. g., if we take four lengths on a ground plan to represent the breadth of a nave (2) and aisles (each 1), 6 will form the base for determining the height of the roof, 8 for that of the summit of the central tower, 16 for that of the height of the spire?"—A YOUNG INQUIRER.—[The query with engraving next week.—ED.]

[2275].—**Fireproof Flooring (French Method).**—There is an English method somewhat similar, and I think superior, so far as regards the disposition of the ironwork, to that mentioned by John Smith in his reply to some one's query on this subject; but the English method has Portland cement concrete in lieu of the plaster used by the French. Can John Smith or any of your readers inform us which is the best filling-in material, the cost of rough plaster suitable for the purpose, and the comparative cost between plaster and cement?—R. B.

[2276].—**Town Hall, St. Helen's, Lancashire.**—Can any correspondent state if any definite arrangement has been arrived at respecting a competition for the above-mentioned building?—F.

[2277].—**Measurement of Brickwork.**—Is there any limit to the measurement of flue as solid work? 9 in. × 9 in., or 14 in. × 9 in., may, of course, be considered as ordinary sizes; but, if in excess of the latter, should they be measured in or deducted?—F.

[2278].—**Diagonal Roof Principal.**—Required the best construction of roof to a building of the L or T form on plan. The difficulty is at the angle or junction of the roof, the span is 20 ft., and the principals 10 ft. apart, so that at this part the purlins will be without support for 20 ft., unless diagonal principals are used, then there is a difficulty with the valley rafter. The roof is open, so that a certain amount of uniformity is required. Some advice will greatly oblige.—S.

[2279].—**Oak Shingles for Church Spires.**—I should be much obliged if any of your readers could give me the following particulars—viz.: The usual size of oak shingles for church spires, and the price per 1,000? How many required to cover a square—that is, 100 ft. superficial? The charge, labour only, for laying same?—SPERO.

REPLIES.

[2270].—**Sash Pulleys.**—The axle of a common sash pulley is similar to the axle of a carriage wheel—that is, the axle is fixed, and the wheel works on it. In an axle pulley the wheel is fixed to the axle, and the latter works in bosses cast on the sides of the pulley-frame in a similar manner to the axle of a railway carriage. Axle pulleys run more easily, and are more durable, than the common kind, and, as a rule, are better made and more expensive.—T. P.

[2273].—**Plaster Work.**—In answer to "A Young Builder," deductions are made for door and window openings. Angles in a cornice are allowed for by being numbered and carried out extra to the superficial contents of the cornice—thus, No. 8 mitres to cornice 1½ in. girth.—R. B.

[2273].—**Plaster Work.**—In measuring plaster work on walls, the openings at doors and windows are deducted, the grounds, however, are not deducted, or any standard that the work is straightened from. As to measuring plaster cornices by the foot super, I never heard of it being done; the usual way is to measure the cornices by the foot run, and state the girth and number and size of enrichments, all mitres and angles beyond four in a room are counted as extra mitres. Some surveyors add one foot for each extra mitre over four. In the case of external mitres, measure the cornice to the extreme length, and count the mitre also.—THOMAS PINCH, Surveyor.

GREENWICH HOSPITAL.—Since the "exodus," some years ago, of the then inmates of Greenwich Hospital, the greater portion of this noble structure has remained almost tenanted. A movement has, however, commenced among persons of influence, including several members of Parliament and Sir E. Watkin, Chairman of the South Eastern Railway Company, for the purpose of calling a public meeting of the inhabitants, with a view to memorialise the Lords of the Admiralty to receive a deputation, who will suggest in what manner the building may be best utilised for national purposes.

Our Office Table.

THE LATE MR. TREVELLYAN GOODALL.—A movement is progressing, having for its object the foundation of an annual art prize in the University College School as a memorial to the late Mr. Trevellyan Goodall. It was in that school that that talented and much-regretted young artist received his general education. A large number of artists, together with many of his personal friends and former schoolfellows, have formed themselves into a committee to carry out this scheme, which promises to be a great success. Many Royal Academicians and other artists of note are on the committee. Mr. John F. Seaton, the treasurer, 163, Camden-road, will be happy to acknowledge subscriptions, and all further information may be obtained of Mr. W. H. Fish, the chairman, or of Mr. Gaston Foà, the hon. sec. 175, Camden-road, N.W.

SUICIDE OF A CONTRACTOR THROUGH LOVE.—On Friday evening week Mr. Richards held an inquest at the "Manor House" Tavern, Green-lanes, Stoke Newington, touching the death of Mr. John Thomas Tatum, aged fifty-three years. Mr. Andrew Tatum, 17, Bernad-terrace, Eden-grove, said that the deceased was his father. He resided at 17, Bernad-terrace, and he carried on the business of a contractor at 228, City-road. Latterly his mind had been in a very desponding state in consequence of his business not having succeeded; but his despondency was increased by the refusal of a lady to marry him after the death of his wife. His business became so bad that he had to borrow money at a high rate of interest. After he did so he often threatened to commit suicide, and on Tuesday he shot himself in Finsbury Park. In his pocket was found a letter, in which he said—"If she had married me this would not have happened. Give her my watch and chain. Good bye." The jury returned a verdict of "Temporary insanity."

THE MANCHESTER BRICKMAKERS.—The hand-brick makers of the Manchester district had a severe lesson taught them on Monday, and if they are wise they will profit by it, and refrain from acts of violence which have of late given them an unpleasant publicity. The two men apprehended on a charge of feloniously setting fire to a house in Broughton, in the erection of which machine-made bricks were being used, were found guilty of the crime, and each received a sentence of seven years' penal servitude. A large number of brickmakers were present during the trial, and appeared to take a deep interest in the proceedings. When sentence was pronounced some of them exhibited a spirit of defiance; but they may accept the assurance of Mr. Baron Martin that the law will be too strong for them.

HAWICK ARCHEOLOGICAL SOCIETY.—A meeting of this society was held on Tuesday week, Dr. Brydon, the President, in the chair. An interesting paper, by Professor Elliot, of Goldielands, on the vitrified forts of Scotland, with special reference to that of Knock Farrell, near Strathpeffer, in Ross-shire, was then read. In it he combated the idea that has been almost universally entertained since the time of Dr. Samuel Hibbert, that they were of accidental formation, resulting from the action of festive bonfires, or beacon fires frequently kindled to give warning of the approach of hostile invaders. He sought to show that they were constructed by the ancient Phœnicians, for the same purpose as the Hudson's Bay and North-West Companies have erected their forts in the northern parts of America.

DUTIES OF COUNTY SURVEYORS.—At the recent Essex Quarter Sessions, the following special report was read from Mr. Stock, the county surveyor:—"I beg to ask for your direction, under the following circumstances:—I have recently been requested to examine the designs of three bridges which were not to be erected under my direction in the usual way, but under the direction of the Surveyors of the Highway Boards; and one of them I am required to superintend, in order that, having obtained my approval, the county may be called on to accept it for future maintenance. The Court will, I think, see that this work of criticism is not only distasteful, but throws upon me a heavy responsibility. It forms no part of the duties required at my hands by the court, but yet under the 5th section of Act 43, George III., cap. 59, the County Surveyor is required to superintend and inspect the erection of any bridge which any person may build with a view of converting it into a county bridge. As this kind of work appears likely to increase, I beg respectfully to ask if the Court wish me to undertake this additional duty within my salary." The matter was referred to the Bridge Committee for consideration.

Chips.

S. Issey parish church, which has been so thoroughly renovated as to be practically a new structure, was on Wednesday week consecrated by the Bishop of Exeter. Some two years ago the tower of the church fell, and the building was in general decay. £2,500 has been spent in renewing it.

The Thames Embankment difficulty will, it is said, be settled by a compromise, the Crown ceding its rights to the reclaimed soil to the Board of Works at a moderate price.

A City Mission Hall has been erected, at the expense of Mr. J. D. Allcroft, at Kentish Town, under the superintendence of Messrs. Spalding & Knight, architects. The general contractors were Scrivener & White.

The Lords Justices on Tuesday morning last discharged, without costs, an order recently made by Vice-Chancellor Wickens for a winding up of the Professional, Commercial, and Industrial Benefit Building Society.

Steps are being taken for erecting a new Town Hall in Leslie. A site has been secured, a design has been prepared, and plans for the building have been drawn out.

The largest obelisk ever known to have been cut from the granite quarries in the neighbourhood of Aberdeen has just been hewn from the Stirlinghill quarry. It measures 25 feet in length, and weighs 16 tons, and is worth, in its rough state, upwards of £200 sterling. It is a beautiful piece of red granite, entirely free from flaws.

Dr. D. Eisenmann, at present engaged in cataloguing the contents of the thirteen galleries accessible to the public in Rome, avers that in an unnoticed picture of the Palazzo Spada he has discovered an original portrait of Albert Durer by Titian.

It is stated that the late Mr. James Yates, of Highgate, has made a bequest to University College, London, for the endowment of two professorships—one of Geology and the other of Archaeology.

An order in Council is published in a supplement to the *Gazette*, empowering the local authorities in seaport towns to take stringent precautions against the introduction of cholera into this country.

A new Temperance Hall, at Gnisborough, erected adjacent to the railway station, at a cost of £1,200, was opened on Tuesday week. The building comprises a lecture-hall, affording sitting accommodation for 400 persons, two good-sized club-rooms, and hall-keeper's residence.

Mr. James Robinson Planché, Somerset Herald in the College of Arms, has been awarded a pension of £100 from the Civil List, in recognition of his literary services.

At the Goldsmiths' Hall, Messrs. Burke & Co., of Warwick House, are replacing the sea-glass and other sham decorations with rare and costly marbles. Mr. R. Hesketh, the architect to the company, is superintending the work. The cost will be about £9,000.

The foundation-stone of S. Jude's Episcopal Church at Ballynaveigh, Belfast, was laid on the 22nd ult. This will be the tenth of a series of churches which are being erected in Belfast.

The foundation-stone of the new Industrial Schools at Artane, county Dublin, will be laid on the 15th inst. Messrs. Meade & Son are the contractors. The estimated cost about £20,000.

A committee has been formed for the purpose of raising funds for the restoration of S. Mary's Church, Saffron Walden. The architect who has been consulted in the matter (Mr. Smith, of Adelphi Chambers) estimates the necessary outlay at £2,093.

A lofty brick chimney, situate near the cathedral, Manchester, was struck by lightning, and injured somewhat during the storm of Saturday last, and is now in the hands of the steeple jacks.

Extensive stabling is about to be erected in Chorlton-road, Manchester, by the Manchester Carriage Company, at a cost of about £7,000. Architect, Mr. W. Murray Smith; contractor, Mr. John Walford.

Heath Common stone quarries, near Wakefield, have passed into the hands of Mr. Stephen Seal, of Darford, Barusley.

The Mayor of Halifax last week cut the first sod of the Widdup Reservoir, which is one of four reservoirs necessary to complete the system of waterworks for the town.

SMALL-POX, FEVERS, AND SKIN DISEASES.—The predisposition to is prevented by Lamplough's Pyretic Saline. Agreeable, vitalising, and invigorating, its effects are remarkable in their cure and prevention. Take it as directed. Sold by chemists and the maker, H. Lamplough, 113, Holborn-bill. (ADVERTISEMENT.)

Timber Trade Review.

PRICES, July 31.—Timber per load of 50 cubic feet:—Swedish, £2 10s. to £2 16s.; small ditto, £2 8s.; Memel crown, £4 to £4 10s.; ditto best middling, £3 7s. 6d. to £3 15s.; ditto common middling, £2 10s. to £2 15s.; Skelleftea balks, 5in. to 6in. square, £1 12s. to £1 18s.; crown Memel oak, £5 15s. to £6 10s. Wainscott, per 18ft. cube: Riga crown, £4 to £5; Memel crown, £3 15s. to £4. Lathwood, per cubic fathom: Petersburg, £5 10s. to £6; Swedish, £3 10s. to £5.

Deuls, &c., Petersburg standard: Archangel, best yellow, £13 to £14 10s.; Wyburg best mill-sawn yellow, £10 10s.; Petersburg whitewood, £8 15s. to £9 10s.; Quebec best floated pine, £17 to £18; ditto best bright, £18 10s. to £19 10s.; ditto second floated, £12 10s. to £13; ditto second bright, £13 10s. to £14; ditto third floated, £9 to £9 10s.; ditto third bright, £9 to £9 10s.; United States pitch pine, £13.

Per 120 12ft., 3in. by 9in., Trois Vistoles first white spruce, £15 10s.; 3in. by 10in., £15 5s. to £15 10s.; 3in. by 8in., £13 to £13 10s.; ditto second white spruce, 3in. by 8in., £12 5s. to £12 10s.; S. John's first white spruce, 3in. by 9in., £13 10s. to £14; ditto unsorted, £13 5s. to £13 10s.; Quebec first white spruce, £16 5s. to £17s.

Flooring boards per square: Dram first yellow, 1in. 8s. 6d.; ditto whitewood, 7s. 3d. to 7s. 6d.; 4in. yellow, 12s.; Fredericksdams, first quality yellow; 14in. by 7in., 13s. 9d. to 14s. 3d.; 1in., 10s. to 10s. 6d.; 7in., 8s.

Trade News.

WAGES MOVEMENT.

LEEDS.—The dispute between the Leeds joiners and their employers, which commenced actively on the 1st of July, has been terminated by an arrangement in the nature of a compromise. The *Leeds Mercury*, commenting on the strike, says:—"Whether the men or the masters have got the best of the compromise we shall not stay to inquire. We congratulate both sides that the dispute is settled, and the only point to which we wish to direct attention is the fact that the mode of settlement now adopted was open to both sides five weeks ago, and might just as well have been carried out then as now, without the bitterness, the loss, and the misery of a month's strike and lock-out. We regret that the Board of Arbitration has been abolished, because such a board ought to have rendered the repetition of these periodical disputes in the building trade of Leeds impossible. That it has been so conducted as to render its dissolution a necessity is not creditable to those who are responsible for such a result. It is far better that these disputes should be settled by some recognised and established authority, having and scrupulously maintaining the confidence of both sides, than simply by the power of the strongest, because the former means harmony and good will between capital and labour, and the latter means jealousy and distrust, ending in perpetual strikes and lock-outs."

DUBLIN.—The carpenters' strike continues, and is a great embarrassment in the case of several large works now in operation. The men demand sixpence a day advance from the present time, and the employers offer fourpence from October next, when their contracts will be completed.

BERLIN.—The masons of this city resolved to stop work from Monday last at every builder's without exception. They have appointed delegates to carry on all negotiations on their behalf with the masters, with a view to a settlement of the difficulties. At the same time a resolution has been passed declaring it to be the duty of every unmarried mason to leave Berlin as soon as circumstances may permit.

TENDERS.

CATERHAM.—For additions and repairs to Bleak House. Mr. Richard Martin, architect. Quantities supplied by Mr. Fred. Sparrow:—

Snethurst	£370
Bray	350
Ward	350
Jarrett	340

GRAVESEND.—For alterations to and the re-seating of the parish church, Gravesend. Messrs. Wadmore and Baker, architects:—

Laseelles	£495 0 0
Marsland	477 0 0
Hutchins	418 0 0
Bradley	406 0 0
Blake	399 0 0
Gough and Lawton	390 0 0
Saunders	385 10 0
Bragger	379 0 0
Capps & Ritso	295 0 0
Gould (accepted)	257 0 0
Rooney	180 0 0

KENT.—For hospital, Kent County Lunatic Asylum, near Maidstone. Mr. Martin Balmer, architect. Quantities by Mr. Geo. Buck:—

Perry & Co.	£3200
Dover & Co.	2999
Bridge	2800
Anscomb	2757
Cox Brothers	2750
Davis	2635
Avard	2600
Abnett	2598
Stiff	2520
Wallis & Clements	2475
Laey & Torkington (accepted)	2731

KENT.—For a house at Beckenham, for Mr. P. White. Mr. W. Seckham Witherington, architect, 135, Cheapside, E.C.

First set of tenders.

Slade

Mark	527 0 0
If five built	2500 0 0
Cole	526 10 0
If five built	2362 0 0
Second set of tenders from same drawings and specification.	
Bradford & Tilney	£690 0 0
If five built	3318 0 0
Davis	528 0 0
If five built	2320 0 0
Neate	490 0 0
If five built	2360 0 0
Hooker & Hains	440 0 0
If five built	2030 0 0
Cave	425 0 0
If five built	1955 0 0

LEYTONSTONE.—For the erection of an Infirmary at the Industrial Schools, Leytonstone, for the Guardians of Bethnal Green. Mr. W. Mundy, architect. Quantities supplied.

Dover, Dorrell, & Co.	£3588 0 0
King & Son	3460 0 0
Rivett	3387 0 0
Ennor	3300 0 0
Arber	3100 0 0
Blackmore & Morley	2991 0 0
Blense	2983 0 0
Croaker	2928 10 0
Sanders	2850 0 0
Rose (accepted)	2739 0 0

NEWCASTLE-UNDER-LYME.—For the erection of a Temperance Hall for Mr. Wm. Warham. Mr. Edwin Penn, architect. Quantities supplied by Mr. H. Blackwell:—

Hall	£1349 10 6
Gallimore	1050 0 0
Harvey & Davis	988 0 0
Sutton & Meadon	968 0 0

S. LEONARD'S-ON-SEA.—For making new roads and drains on the Eversfield Estate, S. Leonard's-on-Sea. Messrs. F. H. Fowler & Hill, surveyors, 32, Fleet-street, London; and 3, Normau-road, S. Leonard's-on-Sea. Quantities supplied:—

Sadler	£455 0 0
Bridgeland	376 0 0
Hughes	327 14 10
King (accepted)	300 0 0

S. MARLYBONE.—For whitewashing and colouring at S. Marlybone Workhouse. Mr. H. Saxon Snell, architect. Quantities supplied.

Manley & Rogers	£192 0 0
Simpson & Sous	160 0 0
Phillips & Son	158 0 0
Ramford	117 0 0
T. G. & E. Howard (accepted)	99 15 0

STOKE-ON-TRENT.—For the erection of four cottages in Havelock-street, for Mr. C. R. Clark. Mr. E. Penn, architect, Stoke:—

Bennett	£1150 0 0
Jones	820 0 0
Hunt	795 0 0
Barlow (accepted)	738 0 0

STOKE-ON-TRENT.—For alterations to Mr. Grove's house, The Villas. E. Penn, architect:—

Harvey & Davies	£29 0 0
Barlow (accepted)	23 0 0

SURREY.—For pulling down and rebuilding a new shop and premises for Mrs. Green, Bridge-street, Godalming. Quantities given by the architect, Mr. John Hallett, Godalming:—

Moon & Son	£428
Holt	420
Gilbert	365

CONTRACTS OPEN FOR BUILDING ESTIMATES.

WAR DEPARTMENT CONTRACTS, August 10.—For the erection of a chapel at the Royal Military Academy, Woolwich.—Colonel W. D. Gossett, Royal Engineer Office, Woolwich.

FOREST HILL.—For additions and alterations to a cottage at Forest-hill.—Theodore K. Green, 22, Ninsbury-place, E.C.

August 7.—For the following property, viz: 7 and 8, Elgin-road, Notting-hill; 35 and 39, Blenheim-terrace, and 21, Kensington-park-road.—Mr. G. Russell, 2, Stanhope-street, Euston-road, N.W.

WALTHAMSTOW, August 12.—For the erection and completion of two mortuary chapel, lodge, and entrance gates.—Mr. Houghton, 15A, St. Helen's-place, E.C.

ST. GILES, CAMBERWELL, August 7.—For the repair of Naylor-road, Ledbury-street, part of Camden-grove North, Acorn-place, St. Mary's-terrace, Meeting House-lane, Victoria-place, Grange-street, and Earl-street.—G. W. Marsden, Vestry Clerk, Vestry Hall, Camberwell.

BERMONDSEY, August 7.—For providing and laying kerbing and paving in Nelson-place, St. James's-road.—B. G. Wilkinson, Clerk, Maltby-street, Bermondsey.

EAST MOULSEY, SURREY, August 7.—For additions and alterations to the present national schools.—Mr. J. C. Boys, architect, 2A, Granville-place, Portman-square.

METROPOLITAN BOARD OF WORKS, August 7.—For the erection of a fire brigade station in Seven Sisters-road, Holloway.—J. Pollard, Esq., Clerk to the Board, Spring-gardens, S.W.

TWICKENHAM LOCAL BOARD, August 10.—For laying down, constructing, and completing about 10,000 square yards of tar asphalt paving.—W. Ruston, Clerk, Earl's Lodge, Queen-street, Twickenham.

WAR DEPARTMENT CONTRACTS, August 8.—For additions and alterations to the Cavalry Barracks, Ipswich.—Royal Engineer Office, Colchester.

STOCKPORT, August 21.—For the erection of St. Matthew's National School, Edgeley.—John B. Eskrigge, Esq., Hollywood, Stockport.

ROCHESTER, August 7.—For the formation of public gardens and walks, and approaches.—R. Pratt, town clerk, Rochester.

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 11, 1871.

ENGINEERING COLLEGE, COOPER'S HILL.

IN spite of considerable opposition on the part of many educational institutions throughout the kingdom, the Civil Engineering College at Cooper's Hill, Surrey, was formally opened on Saturday last. The company, which numbered many ladies among its ranks, was of a select description, as our daily contemporaries are fond of remarking, and consisted almost exclusively of those who are connected in some manner or another with Indian affairs, and of others who are attached to them in the shape of relations or friends. A special train from Waterloo station conveyed the party down to Egham, a station on the South Western line, where carriages were in readiness to take them on to the College, which is situated at a distance of about a mile from the station. Among the members of the party were the Duke of Argyll, the Secretary of State in Council for India; the Hon. Sir Stafford Northcote, Bart.; Major-General Sir W. E. Baker, K.C.B., Vice-President of the India Council; R. D. Mangles, Esq., Sir Henry Montgomery, Major General Rawlinson, K.C.B., Colonel Chesney, the President, the Professors, and other visitors and officials attached to the corps of the India Office.

A few words respecting the building and grounds, and then we shall proceed to the more serious question of the object of this Institution, and the benefits expected to arise from it. The house itself, or more correctly speaking the mansion, was built on the site of an older structure by one named Albert Grant, and the popular opinion therein, current in the neighbourhood and elsewhere, is that it was the confident expectation of the builder that he would ultimately transfer the mansion and demesne by purchase to the Prince of Wales. It is needless to say that this anticipation was never realised, but it matters little, since the Government have purchased it instead of His Royal Highness. The demesne and grounds attached to the residence comprise an area of 125 acres, which has, together with the mansion, become the property of the Government at a cost of £75,000. Large and spacious as the building was, it is not to be supposed that it was of an extent sufficient to answer the purpose of a College, so that, while retaining all the original structure, considerable additions and alterations have been made. The mansion proper is at present devoted to the following purposes:—It contains classrooms for the students on the ground-floor, while the upper portion is appropriated to the apartments for the President and some of the Professors. The dormitories, dining and billiard room, and other portions of an establishment of this nature, which belong exclusively to the student, have been newly erected, and constitute a separate edifice in themselves. While this latter building is appropriately and excellently adapted for its purpose, the same cannot be said of the original mansion. It has been converted to its present use, and the incongruity displayed in the arrangement is as manifest as amusing. What would some of our old masters of Eton and Rugby say to a class-room for students of which the ceiling is decorated in colours and gilding, and the paper on the walls of white and gold! In all probability these ornamental features will not endure very long to belie the utilitarian character of the rooms they at present embellish.

On reaching the College the party, after a brief delay, proceeded to the theatre, where they were joined by the fifty students who a week or two ago passed the examination for admission to the establishment. These gen-

tlemen are not yet in residence, as the term does not commence until early in next month, and besides there is no sleeping accommodation provided for them. The dormitories, as yet, are not furnished, not even with beds, presenting the cheerless aspect of four walls and a gas burner in one corner. We are glad to observe that the staircases are of stone. After seating themselves in the theatre the party were soon gratified by the arrival of the Duke of Argyll, who was conducted to his seat by the President, and joined by his colleagues of the India Board. While giving all due credit to his Grace for the able and thoroughly business-like manner in which he introduced the subject of the College to his audience, and explained the reasons which had led the Indian authorities to establish it in the face of a good deal of opposition, not to say hostility, there were some points in his address with which we are not by any means *d'accord*. Although we acknowledge the truth of the main *raison d'être* of the existence of the Institution, which originated in the fact that duly-qualified civil engineers could not be obtained for service in the Public Works Department of India from the same source that supplied them at home, yet we do not acknowledge that competent civil engineers are not in any case to be obtained from that source. This is the error the Duke fell into. He committed a breach of the first principles of logic, which strictly forbid us to argue *à particulari, ad universale*. It is well known to all those who are acquainted with the whole subject of Indian Civil Engineering appointments, that there were two serious obstacles to really eligible competent young men entering the Indian service. The one was the insufficiency of the pay, and the pensioning and furlough arrangements, and the other the general inferiority of the civil engineers on the staff of the Public Works Department to their military brethren and associates. Within this last year these valid grievances have been modified, but not to the degree they ought to be, or to the extent they must be, if it is expected that a permanent stream of young engineers will annually migrate to serve in India. The Duke and his colleagues assert that because they could not obtain properly-educated engineers for India, therefore they are not to be obtained at all. This, as we have already remarked, is a great mistake. The same men, speaking of them as a class, who execute the splendid engineering work we see at home, are to be obtained for a similar purpose in India or elsewhere. There is only one provision, but it is an indispensable one—those who require their services must bid high enough for them. Otherwise even young engineers will not leave home to risk the thousand-and-one vicissitudes which attend a sojourn in a country so notoriously dangerous to the European constitution as experience has proved to be the case with our vast Oriental dependency. Allowing for the *ex parte* statements in the inaugural speech referred to, the Duke of Argyll no doubt made out his case fairly and truly, and in the interests of his Government he was, of course, bound to stretch a point or so in their favour, even if it were disparaging to the profession in general. Roughly, the preliminary expenses attending the establishment of the new College may be put down at £100,000, and in the present day no English Government, imperial or departmental, can authorise such an outlay without affording the public some satisfactory reason for incurring the outlay.

At the conclusion of his speech, his Grace called upon Col. Chesney, R.E., the President of the College, to describe the course of education which it was intended to adopt, and to enter into any particulars which would be interesting to the audience and instructive to the students who had already passed the preliminary ordeal, and might therefore be regarded as *bonâ fide* members of the establishment. Col. Chesney observed that it was the intention of the authorities to aim high, both

with respect to the professional attainments and general tone and character of the men they selected for their Indian service. We gladly endorse the tenor of the President's remarks, as we maintain that the whole of our professional and technical training is in urgent need of a complete remodelling. Some are of opinion that it should be altered to correspond with the system in vogue in France and on the Continent; but although there is little doubt that some of the elements belonging to that method might be advantageously adopted, there are also others which are completely foreign to our national character. Were these even to be acquired, which would not be a matter of much difficulty, it would be, so to speak, "against the grain," and our professional men and skilled artisans would never thoroughly "take to them." There are to be four principal schools, or divisions of instruction. They are—engineering, with its collateral branches of surveying, levelling, plotting, plan-drawing, and office-work generally; mathematics, pure and applied, with especial reference to construction; physical science; and languages. In addition to the ordinary course, which will be compulsory upon all students, there will also be, after the custom at the Universities, an honour course, which will be voluntary, and in which students will be invited to compete for certain prizes. It did not transpire from the President's speech whether any superior advantages in the way of subsequent appointment and promotion were to ensue from a student being an "honour man," but it may be presumed that such will be the case. Should it not be so, the competitors will not number many, as the ordinary course is in itself sufficiently severe to tax the energies and demand the whole of the time at the disposal of any student whose talents are not of a superior order.

The President having brought his address to a close, the party adjourned to the dining-room, where an excellent cold luncheon awaited them. There were no further speeches or formalities, and so soon as the champagne and viands had been done ample justice to, a move was made for the "grounds." These are naturally exceedingly beautifully situated, and their attractions are enhanced by the care and expense lavished upon them. Commanding from its elevated position a magnificent view of the adjoining country for miles round, the site is well adapted to insure the health of those residing in it. The whole of Windsor Castle, embowered in its verdant foliage, formed a prominent feature in the varied landscape, and was the chief object of the visitors' attention during their pleasant ramble. We were glad to observe that there is a large part of the demesne which is adapted for some better end than mere ornament. There are some capital level fields, which only require well rolling and laying down in places to be rendered available for all those manly out-door sports which have been, and it is hoped always will be, a peculiar characteristic of the English people. There is every reason to suppose that athletic and other sports will be not only tolerated but encouraged at Cooper's Hill, as nothing tends more to induce and foster an upright, independent feeling, and a proper sense of self-reliance and self-respect, in which qualities the professional man should never be deficient.

STAFF OF THE INDIAN CIVIL ENGINEERING COLLEGE AT COOPER'S HILL.

PRESIDENT.—Lieut.-Col. George Chesney, R.E.

PROFESSOR OF CONSTRUCTION.—Calcott Reilly, M.I.C.E.

PROFESSOR OF MATHEMATICS.—Rev. J. Walstenholme.

PHYSICAL SCIENCE.—H. M'Leod.

SURVEYING.—Major Edgecombe, R.E.

MECHANICAL DRAWING.—Lieutenant G. S. Clarke, R.E.

HINDUSTANEE.—Cotton Mather, Esq.

LANDSCAPE DRAWING.—Samuel Evans, Esq.

REVIEWS OF RECENT BUILDINGS.—

IV. FRENCH AND ENGLISH GOTHIC.

IT is our business to-day to notice a work of great importance, and one which has already received a large share of popular applause. There seems to be a general satisfaction, in which we can heartily join, that the Gothic style has, in the S. Pancras Station and Hotel, entered formally on a new field of conquest. The Midland Railway has set the fashion, and there is no doubt that other companies will follow it. Pointed architecture has gained a footing, and a substantial one, in a region which, hitherto, it has entered only in remote corners, and almost by stealth. Having seen a Gothic railway station, we may soon even see a Gothic theatre, and it will be the fault of Mediæval architects themselves if their style, with public taste so rapidly turning in its favour, does not soon transform our cities from end to end. There has been plenty of rejoicing over the success at S. Pancras, and taking it in this sense, perhaps none too much. As a triumph over the tyranny of custom and the force of long-cherished prejudice, we can hardly be too much pleased with the Midland Terminus; as a triumph over the difficulties of designing a Gothic railway station and hotel, our praise cannot be equally unbounded. The hotel, as at Cannon-street and Charing-cross, forms the street front to the railway shed; the latter, spanned by a single roof nearly 250 feet wide, abuts against it. For the main design of the station, we understand the engineer, Mr. Barlow, to have been responsible; that of the hotel, and the architectural details of both buildings, were supplied by Mr. G. G. Scott. We have thus two structures, inseparably connected, but as different in their main character and construction as it is possible to imagine. The hotel, whatever we may think of its details, is at least a work of architecture. It is planned and composed in its main features with a view to make it beautiful as well as useful, for Mr. Scott is too accomplished an architect to fancy that ornament is the beginning and end of a work of art. The station, on the contrary, or at least the great shed covering the platforms, is simply the largest yet constructed of those curved iron tunnels which of late years have become the mask of a London terminus. It is the last and largest product of the engineering mind in this direction, and it is distinguishable from the previous ones by being a good deal uglier on the outside, and not much handsomer within. Its trusses, as most of our readers are aware, are simple braced arches of iron, with no cross tie, which spring from the ground level, and consequently need little abutment. This mode of construction is a promising one, and some day, perhaps, when engineers rise into men, in place of sinking into machines, it may be used with great results. At present, studiously repressing all human faculties but one, the only thing they can do when they light on a new system of roofing is to try who can cover the widest span with it. Nobody, it is true, wants these wide-span roofs, nobody admires them, though vulgar people may wonder at them when they are built. Externally they are simply hideous, an eyesore for miles around, a monument of the stolid insensibility to which, by perseverance, men can ultimately reduce themselves. The modern engineer, judging from his works, prides himself on the atrophy of all his mental powers, except the power of calculation. As for beauty of form or of arrangement, he does not believe it exists, or if he does believe, he hates it. Either he has persistently shut his eyes to it till he can distinguish it no longer, or if he still sees it, it enrages him, as music is said sometimes to enrage people of weak intellect. The one power which he respects and cultivates is the power of calculation; the greatness which can be weighed and measured is the only

greatness he believes in, and even as a calculator he is far from being as profound as the public think him. With the results of a series of experiments once tabulated, a very small knowledge of algebra suffices him; and compared, for instance, with the labour of making a "Nautical Almanac," that of calculating the strains in such a roof as the S. Pancras one is altogether insignificant. The slightest acquaintance with engineering books shows how completely the public are duped on this point. The one real merit of the modern engineer is his practical judgment of materials and labour. For this one he deserves respect; he would deserve more if he had not neglected a dozen other acquirements of equal importance in order to attain it. The so-called "science" of his wide-span roofs and lattice girders is of the shallowest sort, and that sort, nineteen times out of twenty, wofully misapplied. It needs no great genius to invent such a roof as that of the Midland Station, and no great intellect to calculate the strength of it. But it needs much care and much experience to get it properly constructed and put together, and it is just this capacity for practical supervision which has been the redeeming point of the engineering profession. They have often done their work in complicated ways when simple ones were at hand, in expensive ways when cheap ones would have answered the purpose, in revolting, ugly ways when beautiful ones would have been easier; but, such as it is, it has generally been executed well. If their design has often been absurd, their superintendence has often been admirable.

The design of this roof at S. Pancras, then, is simply that of a person who can see but one object deserving the pursuit of a rational being; namely, that of constructing a wider roof than anybody has constructed before. To criticise it on any other ground would be ridiculous. All that can be said of it is that it is more than 80 yards across, and thus plainly proves Mr. Barlow to be, by we do not know how many feet run, the greatest railway engineer in the kingdom. Truly, modern civilisation is a wonderful thing, and its works, if they could see them, might well astonish the builders of the middle ages. From sundry notices which have appeared in the newspapers, there seems, indeed, to be a singular notion abroad that this S. Pancras shed is a Mediæval building. The mistake, perhaps, arose from the fact that, on careful examination, a slight point is perceptible at the apex of its roof trusses, and reporters seized on this as their uniform and infallible criterion of what is, or is not, Gothic. It is doing a great injustice, however, to this remarkable work to class it with the comparatively trivial productions of the thirteenth century. The largest of them has no span which deserves the slightest comparison with it. It may be some apology for them that they are vaulted in stone, since a stone roof of 50 feet wide demands a great deal more constructive science than an iron one of 200; and it may further be pleaded that they are likely to be not much the worse for wear a good many centuries after our modern ones have rusted away and been forgotten. But, allowing all this, they are hopelessly out of the race, for their designers never reached that grand absorption in one idea which is the glory of the nineteenth-century engineer. They complicated matters by thinking of beauty and permanence and adaptation to an end, instead of cutting themselves adrift from all such fancies, and following feet and inches with sublimely undivided allegiance. So they miserably failed, frittering their lives away on trifles like Lincoln, or Beauvais, or Cologne Cathedrals—things no more to be compared with the 240 feet spans of a modern railway shed than are the insignificant works of Raffaele or Leonardo da Vinci with the five-mile long panoramas of an American painter.

In this part of the station, Mr. Scott has

attempted but little. The booking-office, where he seems to have had his own way, is a lofty Gothic hall, sufficiently fine to make us wonder why it was not finer. In other words, it has so much that is excellent in detail that we look for something better than the crude clumsy design of the heavy timber roof, with its diagonal bracing scooped out into quatrefoils of portentous size, and its struts inserted awkwardly as if when the structure had begun to fail. This roof is eminently tantalising; a little more thought and study, to all appearance, would have made it such a complete success that its half satisfactory effect is doubly disappointing. The oak framing and fittings below are very good, and there are some admirable groups of wall-shafts and corbels. Outside the booking-office is a glass and iron roof, the lattice girders of which, are partly, not completely, made to harmonise with Mediæval forms. The treatment of the rain water pipes here is noticeable. The hotel is still unfinished. Its main features are striking and picturesque, the least satisfactory, perhaps, being the truncated roof of the middle tower. Its materials and workmanship, too, are of the best. For quality of brickwork, London has few buildings equal to it. The bricks, moreover, which come from Nottingham, are hard, solid, and square, and promise to be more durable than the sandy red Suffolks in general use. We are glad to see that Ketton stone, which has stood so well in the few parts of the metropolis where it has been used, is here introduced for the weatherings. The other dressings, with the exception of the shafts, are chiefly of Ancaster stone, and though this is never remarkably white, it is too white to harmonise with the dark wall facings. The contrast of colour at present is glaring, and we can only suppose that Mr. Scott, whose work is not usually chargeable with "loudness" and vulgarity, has purposely allowed for the inevitable toning down which will result from the accumulated dirt and smoke of years. In its present state the arcade of shops next the New-road is anything but a pleasant object, and will never, we fear, be looked upon as quite what might have been expected from their designer. Almost the only detail in this arcade which will bear looking at is the ironwork on some of the doorways. This is really excellent, as are the gates, of mixed wrought and cast metal, which are at present lying in front of the hotel. But the general forms in this range of shops and arches, their vousoirs of staring red and white, and the uninteresting pierced parapet which surmounts them, are more like what we are accustomed to in the front of a new public-house than of a structure like the present one. In the hotel itself, we are compelled, with all respect for a master of the Mediæval style like Mr. Scott, to question the propriety—nay, even the truthfulness—of the window treatment generally. We do not like to see what, inside, is a single wide sash made to look on the outside like two narrow lights, by a detached shaft planted opposite its centre. If sashes are used, we like them to fit the openings, and to look as if they were made for their place. We think, in short, that the mode in which the glass is to be fixed, and in which the window is to open, ought to influence the design of its masonry as well as of its woodwork; and that it is not enough to introduce modern construction in a crude and inartistic form, and then cover it up with bits of unnecessary Gothic detail. The architect who uses sashes should design his windows for them; and not let himself be tempted by the beauty of an altogether different type of fenestration, to copy it under circumstances that make it a mere sham. There is a vast quantity of carving, in capitals and cornices, about the hotel; some of it very good, and much of it merely what we pass in every street without special notice. Round the bases of the first floor shafts are groups of small figures, which at present are not in

a state for close examination. There are good mouldings of Early French character in the principal doorways, and in the arches and tracery of the windows. But, in the greater part of such a work as this, tracery, or at least such tracery as is adopted, seems to us to be a mistake; and in this particular we look upon a building like Mr. Somers Clarke's Lothbury offices as a far better adaptation of Pointed art to modern purposes than this vast and showy S. Pancras Hotel.

IRON v. LEAD PIPES.

“OUT of the frying-pan into the fire” is but a homely rendering of the Virgilian line, “Incidit in Scyllam, qui vitare Charybdim;” and it is more than probable that many local boards and corporate authorities, who have never recognised the truth of the proverb in its Classic dress, will soon become aware of it in its vernacular phraseology. It would be difficult at the present moment to decide to which term of the adage the iron and lead pipe may respectively belong, but there is no question there is not much choice left between them. Under certain circumstances and conditions, which vary with the locality, they are both to be feared as mediums for the conveyance of water as well as gas. In this, as in many similar instances, the aid of the chemist is necessary to perfect the work of the engineer and surveyor, and in truth in all matters relating to sanitary reform the combined resources of the two professions are indispensable towards the successful accomplishment of the object in view. Let us consider the case of iron pipes first, and investigate some of the objections urged against their use, as the whole subject is one of the most serious importance to the public at large. It is alleged that iron pipes are porous, allowing their contents to escape, or literally to permeate through the molecular interstices of the material; that, moreover, they leak considerably at the joints, speedily corrode and decay, especially when laid in damp ground, and are not suited for conveying certain descriptions of water, which is to be utilised for potable and culinary purposes. Although the more immediate bearing of this question of iron *versus* lead, so far as the sanitary welfare of the community is concerned, relates to the supply of water, yet its connection with that of gas cannot be overlooked. This brings us to the consideration of the porosity of iron pipes, and the consequent escape of any volatile fluids they may contain.

An obvious distinction must be made between the escape of gas by direct leakage and by permeation. The fact that absolute permeation does take place is incontestable: equally so with leakage. When iron pipes are fresh laid, with new joints, in a perfectly hermetically tight condition, so that no direct leakage can take place, the ground in the vicinity nevertheless becomes in a very short time completely saturated with gas. Again, where gas pipes have been laid near wells the water has been found contaminated by the escape of their contents. But a still more remarkable circumstance has been observed at Croydon and elsewhere. When iron pipes, some containing gas and the others water, have been laid in contiguity, the gas has been found to escape from the one pipe, and permeate through the other until it mixed with the water in it. Extraordinary as this occurrence may appear, it is readily explained in accordance with the chemical theory of the subtle diffusion of gases. It is, in fact, a species of endosmosis. The gas having once escaped from its own confinement impregnates the ground lying about the pipes, and thus we have the pipe containing the water surrounded by gas. It therefore occupies the position of a porous medium between two fluids of different densities, and by virtue of the chemical law already alluded to, they will tend to become

intermixed, with a force inversely proportional to their respective specific gravities. The remedy for this is obviously to diminish the porosity of the pipe, which may be effected either by the employment of another material or by coating the iron externally or internally with some description of protective paint. If this measure were effectually carried out, and the pipes protected externally, a double end would be answered. The permeation would be arrested, and the corrosion and gradual destruction of the pipes materially retarded, if not altogether prevented. It is for this reason that some of the recently-laid gas pipes have been well payed over on the outside with tar. A coating of tar is no doubt better than nothing, but it is not by any means the best preservative that might be used. There are numerous patent protecting and preserving paints, and it is probable that the true solution of the problem lies in the adoption of some one of these, or in the preparation of a special description for the purpose.

Supposing this difficulty overcome, there still remains that of leakage from the joints, which appears well-nigh insuperable. It is not that perfectly sound and tight joints cannot be made in the first instance, for in the majority of cases they are, but they cannot be maintained in that condition. The least sinking of the ground, or any local disturbance, will cause the joints to “draw,” as it is termed, and in a short time they become leaky. The only effectual remedy for this contingency is to lay all water and gas pipes in a subway, a measure that should be made compulsory by Parliament upon all water and gas companies. With regard to the chemical action of water upon iron pipes, so far as concerns the risk of endangering its potability, it may be almost disregarded unless the water be of an unusual degree of hardness. In that case the carbonate of lime will be decomposed, leaving the lime for the stronger base, by the laws of affinity, and a compound will be formed having the chemical equivalent represented by the symbol FeO , CO_2 . This is the same substance which occurs as a natural spathose iron ore, and is also found in the common clay ironstone, from which nearly all our English iron is manufactured. Water containing this mineral is easily known by its reddish rusty appearance, and the deposit of a similar character which is precipitated from it on exposure to the air. There is, however, no reasonable cause for supposing that contamination to this extent would ever result from the use of iron pipes for furnishing the water supply.

Ever since the famous experiment at Ham-burgh, every substance has been acknowledged to be more or less porous, the degree of porosity being inversely proportional to its specific gravity. The same ratio will also represent the permeability of the substance. The specific gravity of iron is 3.79, while that of lead is 11.35, or almost exactly three times that of the former metal. The substitution of lead pipes for iron would thus at once prevent all leakage, except directly through imperfect joints, and the occurrence of this evil could be far more easily guarded against than in the case of iron. These advantages possessed by leaden pipes, to which must be added their greater durability, and freedom from corrosion, are counterbalanced by the manner in which lead is acted upon by water, which presents very unsatisfactory and even dangerous features. If a piece of clean lead be immersed in pure water, and afterwards exposed to the air, in a very short time a white, flaky, semi-crystalline powder is formed, which is soluble in water, and, similar to all preparations of this metal, is a rank poison. One merit belongs to this poisonous contamination, which is that it is easily detected. But as pure water, in the chemical sense of the term, never constitutes the supply provided for towns, we must take the case of ordinary rivers and spring water of a moderate degree of softness. In this

instance the same operation takes place, but in a much less observable degree. Most waters of this description contain a small proportion of sulphates, which causes the deposition of an exceedingly tenuous film of sulphate of lead upon the inside of the pipe, and thus the further formation of the poisonous salt is at once checked. Thus it is that leaden pipes and leaden cisterns are used with impunity, or apparent impunity, in numerous instances for conveying and storing water. However true theoretically this chemical protective action may be, it would obviously be in the highest degree culpable to rely upon its efficacy, when the purity of the water supply of a town was the question at issue. The third case that presents itself for consideration is when water containing a large proportion of carbonic acid is passed through leaden pipes. Under these circumstances the formation of white lead would ensue, which is soluble in water containing carbonic acid.

The conclusion to be arrived at with respect to this important question is that the mechanical advantages of lead are outweighed by its chemical disadvantages. It is well known that very soft water acts most injuriously upon this metal. Besides, lead pipes could not possibly be substituted generally for iron ones, but only on a certain scale, and under certain conditions. It is clear that local boards and the sanitary authorities of towns are placed in a dilemma. They cannot poison the inhabitants on the one hand, neither can they on the other permit the enormous waste and contamination of water which continually occurs. Nevertheless, the course to pursue is clear enough. Whatever may be the mechanical difficulties to overcome, whatever may be the loss by defective joints or corroded pipes, they must all be endured in preference to adopting a remedy which entails a peril to the public health, which cannot be endured. It cannot be too prominently kept in view that no amount of filtration will purify water chemically contaminated. We throw out this suggestion because we have so frequently heard the expression, “Oh, I filter my water, therefore it's all right, wherever it comes from.” Filtration removes mechanically suspended impurities, but not those held in chemical solution.

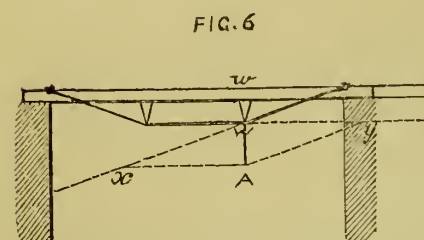
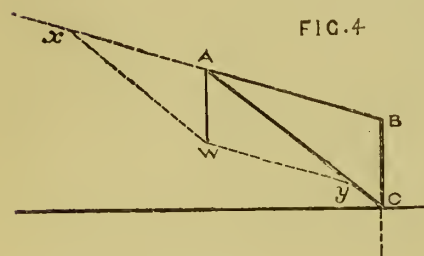
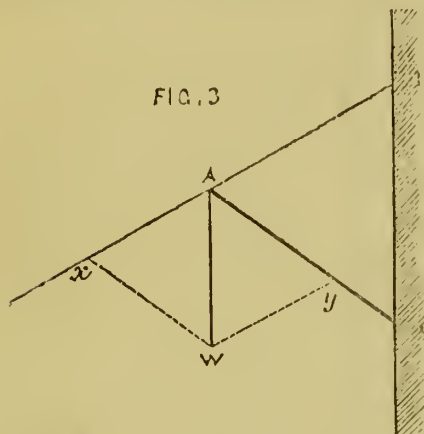
NOTES ON CARPENTRY, AND ON STRAINS IN STRUCTURES.—III.

WHEN a structure is put together so that a pressure on one point of it is transmitted through several members to its final bearing or bearings, it becomes necessary to ascertain how much of the initial pressure is borne by each member, so that the dimensions of each part may be proportioned to the strain it will have to bear. To ascertain these relative strains on the different members of a structure it is necessary to consider in what direction and with what intensity the forces act, and how they are met and resolved, which is the doctrine of the composition and resolution of forces. The easiest method by which to ascertain these relative strains, and an absolutely exact one, is the graphic method; thus, take the simplest form of two members of a structure combined to resist one force, one member of which sustains the pressure or load by opposing to it its inherent power of resistance to compression, and the other its power of resistance to extension. Let Figure 3 represent a strut and a tie projecting from a wall, and let it be required to suspend a weight W , from the point A . To find the tensile strain on the tie AB , and the compressive strain on the strut AC , draw Ax in line with AB . Draw AW vertically of such a length as to represent by scale the weight suspended. Draw Wx parallel to AC , and Wy parallel to AB . Now by the same scale measure the length Ax and Ay ;

the former is the measure of the strain on the tie A B, and the latter that on the strut A C. Or take a crane, as in Fig. 4, where the weight W, suspended from the end of the jib A C, and acting through the intervention of the tie rod A B, and the strut A C, is ultimately borne by the transverse strength of the post B C. In like manner A x and A y measure the strains on the tie rods and the strut respectively by the same scale which measures A W equal to the weight suspended.

Or we may take a trussed girder (Fig. 6) in which case, if W A measure the weight on the point w, W x and W y will measure the strains on the truss rods.

These few examples will show the principle of the graphic method of determining strains in combined structures; there are more complicated cases, but perhaps these may here be sufficient.

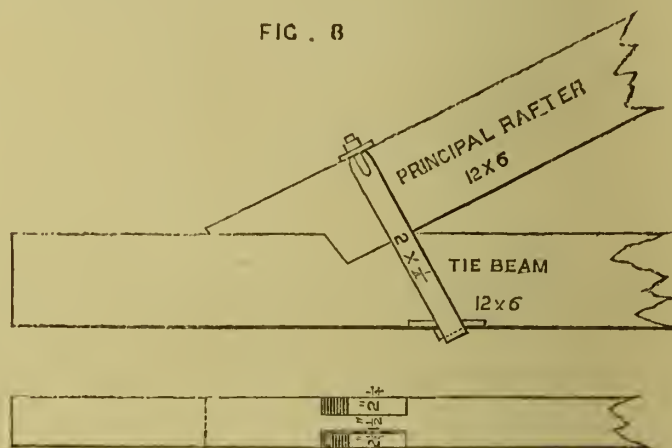
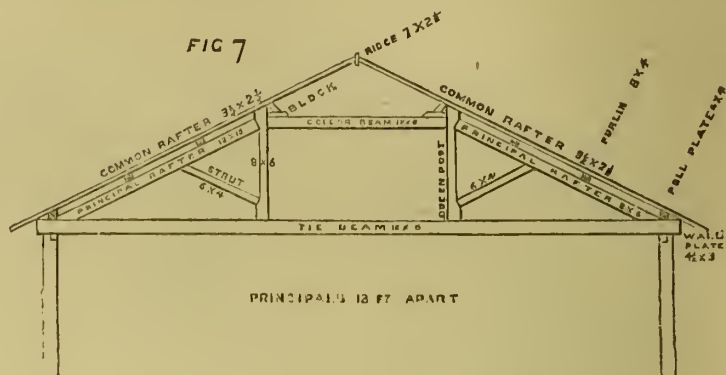


We shall now turn our attention to the more immediate business of the carpenter in the framing together of pieces of timber. Those, however, who take into consideration general principles in performing detailed work will be more likely to execute it well and soundly than those who take no heed of them. There is a hidden current of principles governing all we rightly do, however small or detailed, and those who perform detailed work in accordance with those principles are artists or artisans, while those who neglect them are mere bunglers—rule-of-thumb men—who might be right occasionally by chance, but who, in general, perform work which is worthless, because unsound in principle.

We have endeavoured to give to carpenters some of the principles which, in our view, ought to govern the erection of timber structures, and the present writer acknowledges that some of the most practically useful lessons he himself ever learnt in his profession were learnt from carpenters, from their daily practice and from their kindly conversation, and he has their names now in

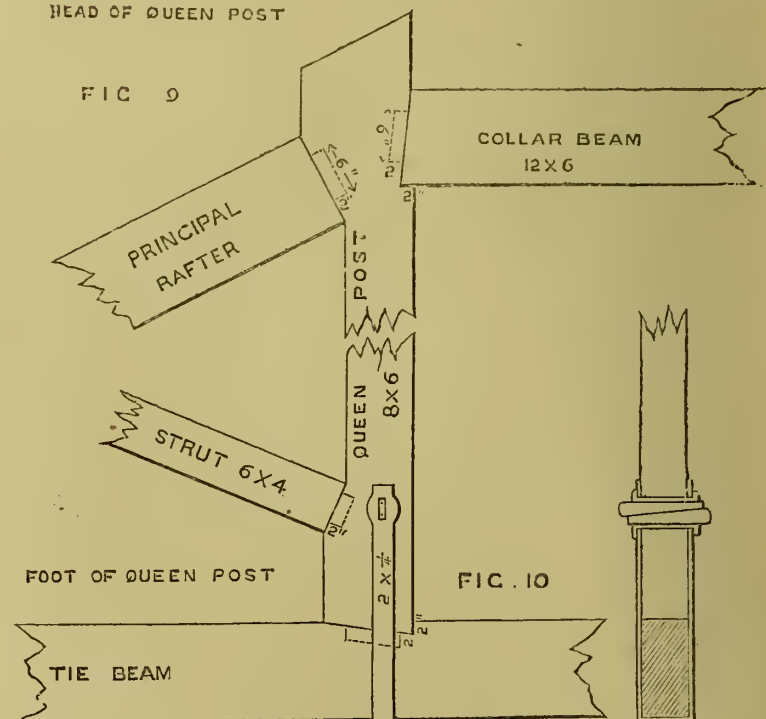
remembrance and in honour. It is by the judicious combination of theory and practice that the efficient carpenter, the efficient engineer, or the efficient architect is to be gauged. It is as impossible for the engineer or architect to live by theory alone as it is for the carpenter to become more than a carpenter by practice alone. We have heard a good deal of the superiority of the Conti-

the time to come, and the conclusion of the Council of the Institution was that, although the Continental engineers had the advantage of us in theoretical education, we had the advantage that our pupils mixed with workmen almost from the first day of their pupilage, and so became better acquainted with the practical mode of dealing with materials, which the Continentals had yet to learn after



HEAD OF QUEEN POST

FIG. 9



FOOT OF QUEEN POST

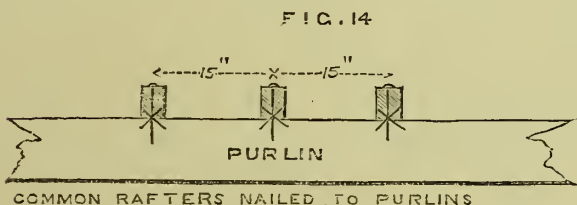
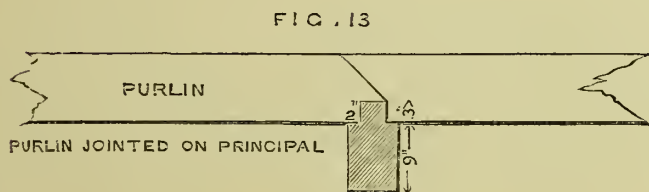
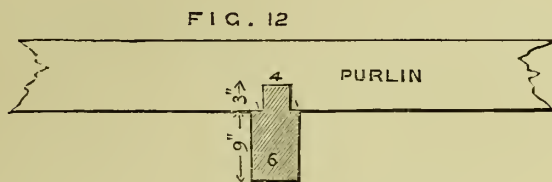
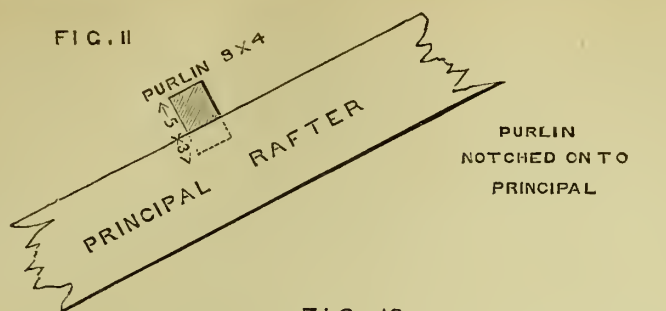
FIG. 10



mental workmen, the Germans in particular, because they have had a good education in general principles before they come to practical work; and the Institution of Civil Engineers lately instituted an inquiry into the systems under which Continental engineers were educated, with a view to the improvement of the status of English engineers for

they became placed in positions of trust and authority. And so it comes about that we learn from each other, if we will only have in consideration that it is necessary to respect each other's position.

Figs. 7, 8, 9, 10, 11, 12, 13, and 14 are sketches of an executed roof, and represent a queen-post roof of 50 ft. span over a railway



goods warehouse, and when we come to point out the reasons why the several parts are cut and framed as represented, we shall have occasion to make a remark upon the observations we have just made.

INFORMATION FOR AMATEURS.—GLUE-ING, VENEERING, POLISHING.*

GLUEING.—The right sort of glue to use for ordinary work is "best Scotch" (inferior kinds are often adulterated with lime). This glue is sold at all good tool shops; but if it cannot be obtained choose the most transparent cakes. For fine work in light-coloured woods, Salisbury glue may be used; this is made in thin cakes, and is of a clear amber colour.

PREPARATION OF THE GLUE.—Break it into small pieces with the hammer, and soak for at least twelve hours in sufficient water to keep it covered even when swollen by the water it absorbs; this water must be cold. It is no use attempting to melt glue by putting it into hot water; it will always be stringy, and give endless trouble. Put the pieces of soaked glue without any superfluous water into the glue pot, taking care that the outer vessel is kept full of water, which will prevent the glue in the inner vessel from burning; this is very important.

The glue will soon dissolve; it will be thin at first, but quite strong enough; subsequent boilings will, however, improve it, so long as it is never allowed to burn; indeed, as water is driven off by evaporation, more will have to be added. If stronger glue is required, it may be made with beer instead of water, and stronger still if linseed oil is added to it instead of water as the original water in which it was dissolved is evaporated by boiling.

Cleanliness is very essential to the well-being of glue; a wooden cover should therefore be provided for the pot, and if any dust or dirt is on the cold glue, it should be just washed off before putting the pot on the fire. A scum always rises as the glue boils; carpenters generally stir this in with the brush, I prefer to skim it off, and put it in a gallipot, where it accumulates and settles with

waste scrapings, and much of it may be utilised afterwards.

A wire stretched across the pot is very useful to remove superfluous glue from the brushes; this is much better than pressing them against the edge of the pot, where quite enough glue is sure to accumulate and burn.

Never use any of that old dried-up and burnt glue, which may be generally found in the bottom of a glue pot kept in a kitchen; have the whole concern boiled out in a saucepan before you put your nice clean glue into the pot.

HOW TO USE THE GLUE.—It must not be supposed that the strength of a glue-joint depends upon the quantity used; those joints hold the best in which the pieces of wood are brought closest together. The following is a brief description of the process to be pursued:—Have the glue as hot as possible, the glue pot within easy reach, a basin of hot water, and a bit of sponge on the bench. Cover quickly with hot glue both the surfaces to be united, and rub them together, pressing out all the glue that can be got rid of; let the motion of the one piece on the other be but slight; for instance, in a three foot joint the top piece need never move more than an inch or two beyond the other, which is fixed, it is supposed, in the bench screw; it will be soon felt that they are inclined to stick together, then they must be brought at once to that which is to be their final position, and not moved again. Superfluous glue may now be wiped off with the sponge when necessary, *i. e.*, when it is in an angle or an awkward place to get at afterwards; but as a general rule, and particularly in a long joint, it should be left on till cold, for it excludes the air, and goes a long way towards making a good permanent joint.

If the edges of two long boards have to be glued together, the job will require two hands. One board having been fixed in the bench-screw, the other is rested against it, so that the edges meet obliquely, making a very blunt V. While one workman steadies this second board (with the help of a weight, or the jack planes on the bench to keep it from slipping), the other, holding the glue-pot in his left hand, passes the brush, well loaded with glue, rapidly along the edges; he must not mind wasting his glue; there is no time now to be careful about spilling a drop or two. When the edges are

quite covered, he takes one end of the loose board, his assistant the other, and they rub it up and down a time or two till it sticks, as with shorter pieces.

And here note that if you are not skilful enough to shoot a perfectly true edge on your board, make it slightly concave rather than convex; for the ends have a tendency to rise.

In gluing flat pieces of wood together, such as two or three thin pieces to make one thick, with the grain running two or three different ways, screw-clamps are required. These are wonderfully useful things, for many purposes, very cheap, and not half enough used by amateurs.

VENEERING.—The softest woods should be chosen for veneering upon—such as common cedar or yellow-pine;—perhaps the best of all for the purpose is "arrow-board," twelve foot lengths of which can be had of perfectly straight grain, and without a knot; of course no one ever veneers over a knot. Hard wood can be veneered, boxwood with ivory, for instance; but wood that will warp and twist, such as nasty cross-grained mahogany, must be avoided.

The veneer, and the wood on which it is to be laid, must both be carefully prepared, the former by taking out all marks of the saw on both sides with a fine toothed plane, the latter with a coarser toothed plane. If the veneer happen to be broken in doing this, it may be repaired at once with a bit of stiff paper glued upon it on the upper side. The veneer should be cut rather larger than the surface to be covered; if much twisted, it may be damped and placed under a board and weight over night. This saves much trouble; but veneers are so cheap, about 1d. a foot, that it is not worth while taking much trouble about refractory pieces. The wood to be veneered must now be sized with thin glue; the ordinary glue-pot will supply this by dipping the brush first into the glue, then into the boiling water in the outer vessel. The size must be allowed to dry before the veneer is laid.

We will suppose now that the veneering process is about to commence. The glue in good condition, and boiling hot, the bench cleared, a basin of hot water with the veneering hammer and a sponge in it, a cloth or two, and everything in such position that one will not interfere with, or be in the way of, another.

First, damp with hot water that side of the veneer which is not to be glued, then glue the other side. Second, glue over as quickly as possible the wood itself, previously toothed and sized. Third, bring the veneer rapidly to it, pressing it down with the outspread hands, and taking care that the edges of the veneer overlap a little all round. Fourth, grasp the veneering hammer close to the pane (shaking off the hot water from it) and the handle pointing away from you; wriggle it about, pressing down stoutly, and squeezing the glue from the centre out to the edges. If it is a large piece of stuff which is to be veneered, the assistance of a hot flat iron from the kitchen will be wanted to make the glue liquid again after it has set; but don't let it dry the wood underneath it, or it will burn the glue and scorch the veneer, and ruin the work. Fifth, having got out all the glue possible, search the surface for blisters, which will at once be betrayed by the sound they give when tapped with the handle of the hammer; the hot iron (or the inner vessel of the glue pot itself, which often answers the purpose) must be applied, and the process with the hammer repeated.

When the hammer is not in the hand, it should be in the hot water.

The whole may now be sponged over with hot water, and wiped as dry as can be. And observe, throughout the above process never have any slop and wet about the work that you can avoid. Whenever you use the sponge, squeeze it well first. Damp and heat is wanted, not wet and heat. It is a good thing to have the sponge in the left hand nearly all the time, ready to take up any moisture or squeezed-out glue from the front of the hammer.

So much for laying veneers with the hammer, which, though a valuable tool for the amateur, is not much used in the best cabinet makers' shops; cauls are adopted instead. They are made of wood, the shape and size of the surface to be veneered, or, better still, of rolled zinc plate, and being made very hot before a good blaze of shavings, they are clamped down on the work when the veneer is got into its place; they must be previously soaped, to prevent them sticking to the veneer. The whole is then left to dry together. The hammer is quite sufficient for most amateurs. I have laid veneers with it 5ft. long by 18in. wide, without assistance, and without leaving a blister. Cauls, however, are very necessary if a double curved surface has to be veneered, or a concave surface; they need

* By SHEPHERD B. BARNABY (from the *Quarterly Journal of the Amateur Mechanical Society*).

not be used for a simple convex surface. By wetting well one side of the veneer it will curl up, and can easily be laid on such a surface; but it will be well to bind the whole round with some soft string to assist it in keeping down while drying.

POLISHING.—No attempt at scraping, sand-papering, or polishing veneered work must be made till the glue is perfectly dry and hard. It should be left twenty-four hours in a warm room at least, and better still if left two or three times as long.

The processes for French polishing vary somewhat, according to the nature of the wood. For common work in deal, the wood may be well sized first, then papered with fine glass-paper, and polished.

For mahogany, walnut, and similar porous woods, the pores must be filled by rubbing in, on a roller of old carpet, a mixture of Russian tallow (that is, tallow free from salt) and plaster of paris, well amalgamated, before the fire in cold weather. Russian tallow may be had at most oil shops generally pure enough; but if the presence of salt is suspected, refine it by boiling it in plenty of water, stirring it well, and skimming it. Set it by to cool, and use the cake of tallow which will be at the top.

The more this filling-up process is persevered in the less will be the subsequent labour in polishing; quite a bright surface should be got up by this alone. The mixture of tallow and plaster may be darkened with red lead for mahogany, or other colouring matter according to fancy.

This filling is not necessary for boxwood, ebony, or other of the hard woods.

To polish a surface thus prepared, not being hard wood, and not in the lathe, take a ball of cotton wool saturated with methylated French polish; cover it with a fold of linen cloth; on the linen cover put, with the tip of the finger, a drop or two of raw refined linseed oil (not "boiled oil"); get on a good body of varnish by rubbing always one way with circular strokes; be very careful to go over all the ground each time you work round the surface; and do not go over the same spot twice before you have gone over all. The longer this is done the better. Never mind the smears, which, though they look queer, are the very appearance you want at this stage. Having got on a good body, leave your work and take to another piece. It is good to leave it, if convenient, even for a day or two. By the way, shut all doors and windows before you begin. You can't do French polishing in a draught or in a very cold room.

When you resume work, use a mixture of half methylated French polish and half methylated spirit, or less than half of the spirit when you commence, and put now as little as possible on the wool, covering it with more than one fold of fine linen or cambric. Very little oil, as before—only just enough to prevent the rubber from sticking to the work; go over it lightly, with an easy gentle touch, in circular strokes, all one way. Never mind the smears. When it comes to look something like a good result, which it soon will, you may take out the smears by rubbing up and down with a mere trace of spirit on wool well covered with the linen, but avoid going over the same place twice, and be very light and gentle, or you will remove your polish. Finally rub it well with a clean wash leather (carefully folded, so as to leave no hard crease which will scratch), or an old silk handkerchief, breathing on the work occasionally.

Boxwood, ebony, cocus, &c., may be rapidly polished in the lathe. At first get a body out of polish, and this can be done without using any oil. The work must not be turned round rapidly, but the pulley of the lathe moved slowly by hand; then use your rubber with a drop of oil, and finally, the polish thinned with spirit.

If either on flat or turned work you require a very superior polish, you may remove nearly all the first coat with fine glass-paper, and put it on again, which will not take long, the pores being all filled. Remember that throughout the oil is only used to prevent the rubber from sticking, and it has to be got out afterwards with the spirit; so never use more than necessary.

In the lathe, when you come to the wash leathers, the work may be driven rapidly. A bit of ebony can be polished in five or six minutes to such a surface that small print can be easily read in it as in a mirror. Don't use your rubbers when they get hard and dry, but, nevertheless, stick to an old one as long as you can, and if you have to put them by, keep them in a tin box tightly covered.

Recently a piece of glass, measuring 100 superficial feet, underwent the process of silvring at the works of Messrs. Pratt and Co., Peasley-cross, S. Helens.

PREEN MANOR HOUSE.

THE Manor House of Preen, of which we this week give an illustration, lies between Shrewsbury and Much Wenlock, on the side of a valley which falls away grandly from the house, and rises on the opposite side, at a distance of about three miles, to the long high ridge known as Wenlock Edge. The house is on the site of a cell formerly in connection with Wenlock Abbey, and it was at first intended to incorporate portions of the old walls into the new building; but they proved to be so entirely decayed that this was found to be impossible, and, though portions of the new house occupy the same site as the old, no portions of the old walls exist.

The parish church, to which the house is actually attached (and from which it gets the name of Church Preen), is of very startling proportions, being upwards of 70ft. long, by only 12ft. wide, inside. It was carefully though plainly restored some four or five years ago. On the north side is the churchyard, raised on a high level, and chiefly remarkable for an extremely large old yew, unfortunately in a very decayed state.

The approach to the house winds through a beautiful wood. The entrance-door is on a low level, and a wide stone stair leads up to the principal floor. On the ground-floor are the billiard-room, business-room, lavatories, and housekeeper's and butler's departments, whilst in the rear, and on a slightly higher level (so as to suit the fall of the ground) are the kitchens and offices connected therewith.

The principal floor contains a hall and staircase about 35ft. by 18ft., from which enter the drawing-room and library. The large bay window in our illustration is on the north side of the drawing-room, and commands a fine view of a hanging wood adjoining, whilst a corresponding bay to the south overlooks the flower gardens and more distant landscape. Corridors lead right and left from the centre hall, one to the dining-room (the three lofty windows of which are shown in our view), the other to a music-room of large size, chiefly lit by a window at one end, opening into a terrace about 200ft. long, from which magnificent views over the valley are obtained. The kitchen garden is on one side of this terrace, and separated from it by the high wall, a bay or two of which is shown.

Numerous bed and dressing-rooms occupy the upper floors, from nearly all of which fine views are obtained. The house is built of local stone, with dressings from the Longnor quarries. The gables and half-timbered work are of oak, and in parts are richly moulded. The chimneys are of cut and rubbed red brick, and, as may be inferred from the drawing, are enormous. The roofs are of red Staffordshire tiles. The house will have an ample water supply from a large reservoir, fed by springs, on the high land in the rear, and at a distance of about half a mile, and it will be lit by gas from an apparatus placed down in the valley. The corridors, stairs, and principal rooms will be heated by hot-water coils, in addition to the open fire-places. There are extensive stables and outbuildings at the back, and a good range of greenhouses in the kitchen garden, a large fernery, and a conservatory.

The architect of the building is Mr. R. Norman Shaw, and the illustration, as given by us, is a photo-litho. reproduction of Mr. Shaw's admirable drawing, which many of our readers no doubt saw this year at the Royal Academy.

THE THAMES EMBANKMENT EXTENSION.

ON Saturday the foundation-stone of the Chelsea section of the Thames Embankment was laid. This new piece of embankment will reclaim nine-and-a-half acres of ground from the river. There will be a roadway upon it 70ft. wide and three-quarters of a mile long, and the rest will be planted out in ornamental gardens. This additional three-quarters of a mile will bring up the entire length of embankment-road from Blackfriars to Battersea-bridge, four-and-a-quarter miles, short the break between Westminster-bridge and Millbank, which is something under a quarter of a mile. The river wall at Chelsea will be of concrete, faced with granite, similar in this respect to the Albert and to the eastern portion of the Victoria Embankment. The introduction of Portland cement concrete in lieu of brickwork will, in this work alone, effect a saving of £21,000,

and for this we are mainly indebted to the experiments made at the instigation of the Board of Works, and consequent improvements in the manufacture of Portland cement. The granite, instead of being dressed to a smooth face as in the other embankments, will be simply hammer-dressed, which will give it a character of massiveness. The parapet which will be of solid granite, will also be made of a bolder and less refined contour than in the Victoria and Albert Embankments, to harmonise with the general appearance of the wall. Owing to the most favourable character of the ground and the nature and extent of the river traffic at this part of the river it has been deemed unnecessary to carry the foundations of the wall to so great a depth as in the case of the embankments lower down the stream. In this embankment they extend to four feet below low water spring tides, and this will enable the work to be executed without the aid of the whole-tide cofferdams, a condition which very materially lessens its cost. The width of the river wall, when the new works are complete, be of a nearly uniform width of 700ft. At present the width varies from 700 to 850 and at the western end, near Chelsea Hospital, the mudbank is in some places as much as four feet depth.

THE ARCHITECT OF THE SCOTT MONUMENT.

THE present Scott Centenary enthusiasm in the north brings into prominent notice the architect of his monument in Edinburgh. Mr. David Cousin, the well-known architect, contributes an interesting letter to the *Scotsman*, in which it supplies various details regarding the life and talents of David Kemp, the architect of the Scott monument:—"Kemp," he says, "was bred joiner, and was one of the neatest-handed workmen of his day. There are still several specimens of his handiwork to be seen. His principal work in the department is perhaps the model of Dalkeith Palace which he executed under the direction of the late Mr. Burn. He also made a laborious and minute model, to a large scale, of Glasgow Cathedral, and cut in wood—to the most minute detail—embracing a design he had conceived of a restoration of the greatest of our Scottish ecclesiastical remains. Sir George Ballinghall, the late Professor of Military Surgery, employed a relative of my own to make models of litters for the removal of the wounded from the field of battle; and as Kemp had been for several years in the employment of the friend referred to, he was, as a matter of course, employed in these intricate pieces of handiwork. I well recollect his 'tool-chest,' made by himself in spare hours after his daily task was over—a model of neatness in its way. While thus devoted to his calling, his higher genius ever led him to seek solacement in art and poetry. Shakespeare, Spenser, Chaucer, Sir David Lindsay, and Drummond of Hawthornden were his special favourites among our earlier poets. Burns and Scott of the more recent. He had a most tenacious memory, and was ever ready with apt quotations of the more racy and quaint portions; so that his social powers of amusement were of no mean order. Although not a great musician, he could give a capital comic song in character. But architecture was his ruling passion. He has told me that York Cathedral stirred his soul to its inner depths. Latterly he gave full vent to his enthusiasm for this branch of art by taking up his abode in the various cathedral towns in England, working there as a joiner for weeks or months as fancy dictated, until his researches were completed, when he lifted his tool-chest and betook himself elsewhere. He visited France in the course of his rambles; and it was shortly after his return that the advertisements appeared requesting competition designs for a monument to Sir Walter Scott. This fired his ambition as he was an enthusiastic admirer of the Wizard of the North, and he entered the competition and beat all who entered the lists against him. Before closing this hasty reminiscence of my early friend, I may record an interesting incident which I have heard him relate. When an apprentice to a country tradesman somewhere in the neighbourhood of Peebles, he was trudging along the public road on a warm summer day, broiling in the sun, with his tools swung over his shoulders, when a gentleman's carriage drove past. It stopped. The gentleman asked the youth where he was going, and finding it was in the same direction, he desired the footman to take up the younger beside him. This was the first time Kemp saw Scott, who, with wonted benevolence, had compassion on the wayworn traveller."

We are pleased to be able to state that a satisfactory settlement has been come to with regard to the strike at the Wimbury Collieries, in Cannock-valley.

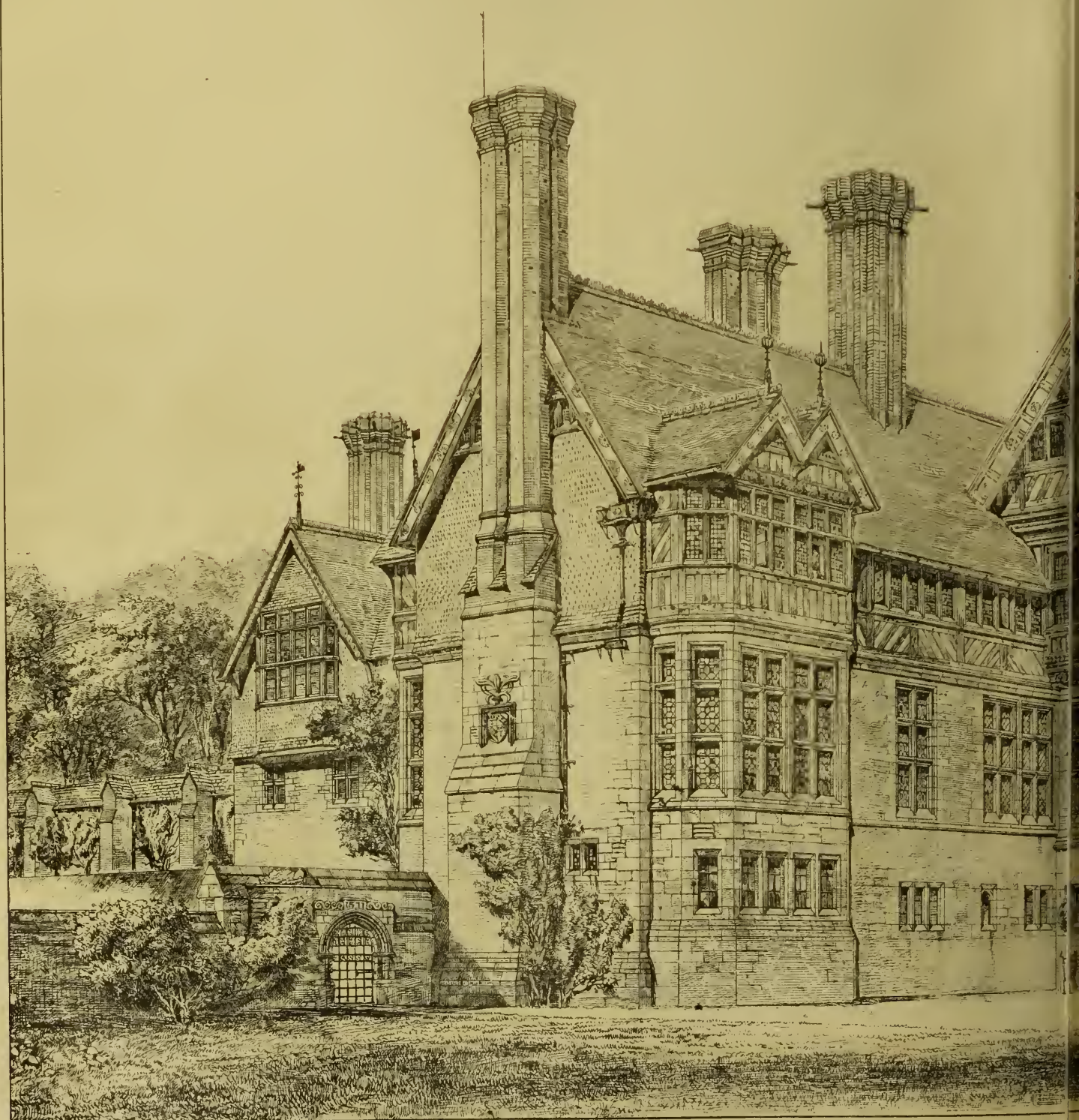
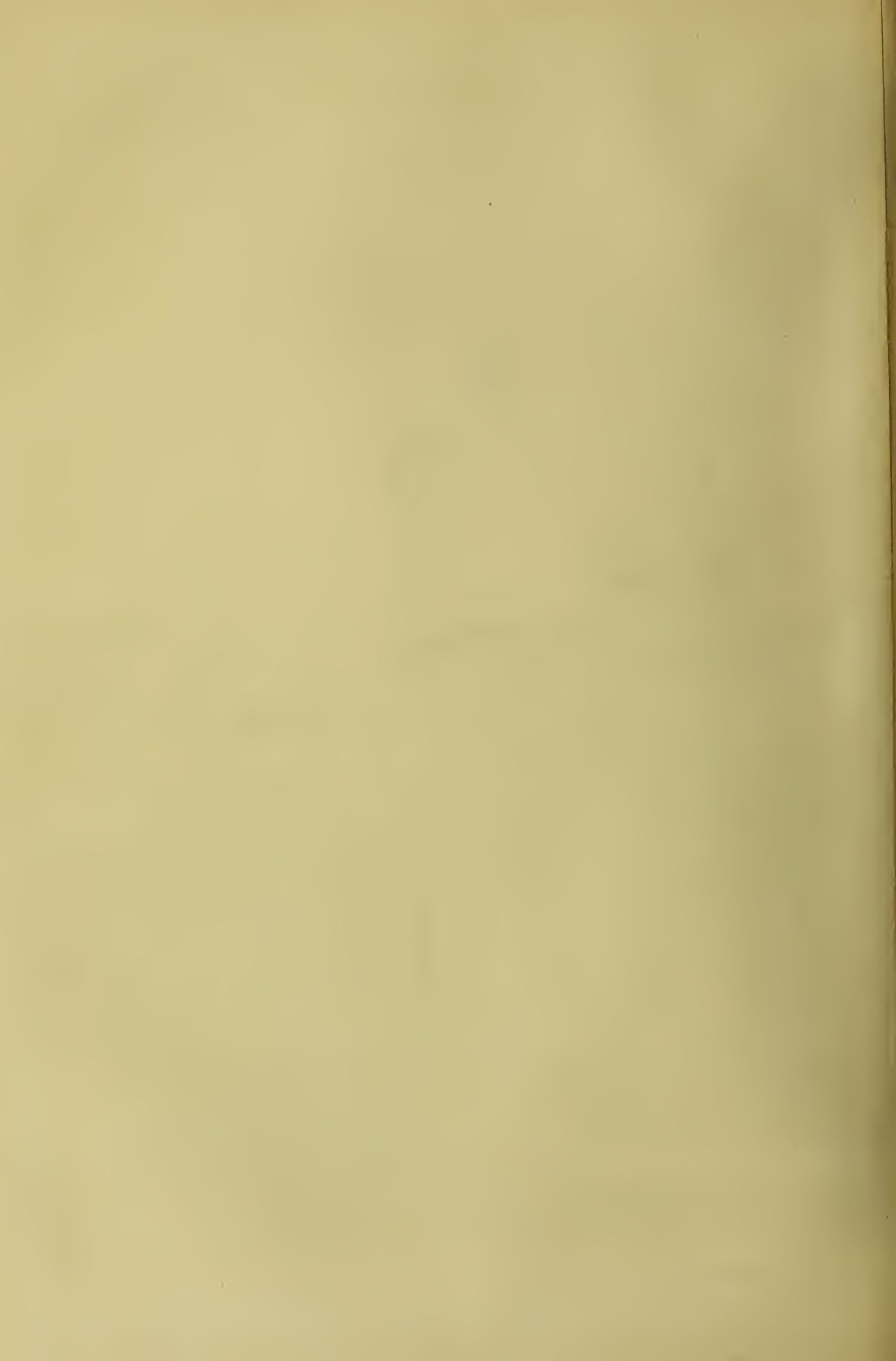


Photo-Lithographed by Whiteman & Bass London

PREEN MANOR HOUSE
R. NORMAN SHA



SE. N.E. VIEW



ON ARCHITECTURE AND ITS RELATION
TO MODERN LIFE.*

BY AN ARCHITECT.

(Concluded from page 76.)

THE principles we have endeavoured briefly to elucidate, though most completely illustrated in the two styles selected for reference, may be equally exemplified in every class of architectural design. It may be that few really original designers are conscious always of deliberately following out such principles; but they do so by intuition, while to the public, who are the employers and to some extent the critics of the architect, a general idea of the principles on which architectural design is based should certainly be of value. If, for example, the Classic column were understood as a feature expressive of resistance to vertical pressure, we should see no such absurdities tolerated in our towns as the use of a single such column, with a small statue hid away on the top, for a monument; it would be seen that such an erection is an absurdity. So of a hundred other misapplications of well-known architectural features, which stare us in the face in every street, without exciting a suspicion as to their fitness in the eyes of most of the passers-by, and which attain their most unhappy and grotesque development in some of the great engineering works which are the pride of the present generation. As a nation we are (at present) good engineers and bad architects, and our engineers, who have carried out, with equal energy and ability, some of the most important practical work of the present day, have taken (like the Romans) to borrowing stereotyped architectural features, and applying these to their structures in the vain idea of thereby making the latter "ornamental." We will mention one instance, familiar to most of our metropolitan readers, as it forms a singularly apt illustration of what we mean by the misapplication of an architectural feature; we allude to the new bridge over the Thames at Blackfriars. Standing on the Embankment and looking along this bridge, we see that the outer face of each pier consists of a huge cylindrical granite pillar, of very thick and squat proportions, carrying a Brobdingnagian spreading capital. Now, the evident expression of such a feature, of such proportions and material, is that of power to sustain an immense vertical pressure. What does it really sustain in this case? A light balcony thrown out from the footpath over each pier, for the convenience of loungers on the bridge. Let the most unarchitectural spectator once look at the feature in this light, and he must see its absurdity. Observe, the mass of material forming the column may be a necessary addition to give greater stability to the pier, but it has been added in the wrong form and with the wrong expression; it should have taken the form of a buttress, or shoulder, leaning towards the pier and adding to its apparent stability, not that of a ponderous vertical pillar sustaining next to nothing. This is only one out of many instances of the total and absurd ignorance of architectural design displayed in some of the largest and most expensive engineering works which are being carried out in this country, and which will remain as phenomena for the criticism of a better-educated generation.

While, however, architectural design is governed, as we have attempted to show, by certain broad and universally applicable principles, there are other influences, the nature of which is concisely indicated in our quotation from the great French literary architect of the present day. Unlike the purely ornamental arts, architecture is based in the first instance on the practical requirements of every-day life; unlike them, too, its productions are exposed to all the vicissitudes of seasons and weather. Hence its local characteristics will be influenced both by the social and political habits and creeds of the various nations who cultivate the art, and by the climate under which it is developed. And a little consideration will show that the former class of influences assert themselves most in determining the general arrangement and style of a building, the climatic influences acting, in general, more on the character of the ornamental detail. Underlying both, indeed, there is that subtle connection with national character and feeling, perceptible in both the general design and the ornament of every independent and unforced architectural style, which is felt by every educated observer, but which evades all attempt to describe or define it in words. We see in the Grecian temple, "of small and delicate proportion," the outward type of the Hellenic mind, in its clearness, its serenity or blitheness (*Heiterkeit*), its freedom from passion; in the Gothic cathedral, the fierce flame of Mediæval religious fervour and

gloom and aspiration, as it breathes through the sacred Latin poetry of the period; in the fanciful exuberant ornament of the Saracenic style, the material counterpart of the Oriental mind in its voluptuousness and wealth of imagery; or even in such a less pronounced style as that of our own Queen Anne period we can recognise the aspect and spirit of the prim, *fade* gentility of those "teacup times." But such relations between architecture and national character elude definition. Looking, however, at the more practical relations between national manners and architecture, we can see that where a nation is eminently ecclesiastical in its government and theory of life there will arise temples, planned with more or less regard to the convenience of the general crowd of worshippers, as there are less or more of hierophantic mysteries in the celebration; that under a secular despotism costly palaces and mausoleums will form the staple buildings of a country; that in a commercial community, where merchants rank as "princes," exchanges and offices will assume a palatial aspect; that where social and domestic life is above all valued, a corresponding impulse will be given to the erection of buildings in which unpretending comfort and cheerfulness will be the predominant characteristics; and so forth. The character of ornament and treatment of detail, on the other hand, is, as we observed, mainly (though for the most part unconsciously) determined very much by climate, a clear air and bright sunshine giving effect to a delicate relief of surface and moulding which in a more dull and misty climate would be tame and ineffective; while the bold shadows and sharp contrasts of line and surface rendered necessary (as in English Gothic) under a Northern sky would appear too heavy and pronounced in a stronger sunlight and clearer atmosphere.

These relations of architecture to climate and national customs and polity have been fully exemplified in all genuine and unconventional architectural styles throughout the world, even in those which, like the Chinese, are artistically worth little notice. Till a comparatively recent period of history the buildings of nearly all nations were the natural outgrowth of the influences of their respective climates and habits of life, and therefore were almost necessarily suitable to, and characteristic of, the purposes for which they were built. It was in the *Cinque-Cento* period that the movement arose which was to revolutionise architecture, for a long period at least, in this respect. From this time architecture was regarded, more or less, not as the art of building suitably and expressively, but as the art of reproducing and imitating architectural features belonging to a former period. The Italian Renaissance, which it has become the fashion recently to talk of as the death-blow of architecture, does not merit all the obloquy it has received on this head. The movement in Italy was a general enthusiasm for a great intellectual past in literature, carrying with it a corresponding enthusiasm for the architectural forms of the same epoch, which it must be remembered had originally grown in the same climate and on much the same soil whereon it was proposed to reproduce them. Moreover, the Renaissance architects, the best of them at least, were no servile copyists: they invented new combinations of the old forms, and produced a style to be commended both for artistic effect and suitability to the climate and circumstances of the country. Domestic splendour and luxury could hardly be better expressed than in some of the Florentine palaces of the period. It was the transportation of the Renaissance to climates unfitted for it, and where also it received less delicate and refined treatment, which made it the bane of architecture in our own and other countries. Since then, as was observed at the commencement of these remarks, we have had in England two separate "Renaissances" of our own, under one of which the land now groaneth and travaileth. Our Grecian Renaissance was almost a purely architectural one, brought about by the publication of certain ably got-up works illustrating the remains of Greek temples. The mania was almost universally prevalent for a short time, and a Greek temple was the "front" for everything, from a church to a betting-office; only one or two able artists, such as the late Mr. Cockerell, achieving something like an original adaptation of the style. The Gothic revival here, however, is almost the precise counterpart of the Renaissance in Italy, including as it does a Mediæval dilettantism extending to the revival of Mediæval myths and literature, and the brushing-up of ecclesiastical old clothes, just as the Italian Renaissance included the revival of Platonic philosophy and Ciceronian Latin; with the difference that in the English revival the architectural movement, which in Italy was only a secondary result of the Renaissance, seems rather to

have taken the lead, and given occasion for the other developments of Mediævalism which have followed in its train. Of the two modern English revivals, the Greek was one absolutely without excuse; it was the transplanting here of a style suited, practically and artistically, only to a bright sunny climate and to special materials, and totally opposed to all the habits and requirements of English life. The Gothic revival in England has, like the Italian Renaissance, the merit of being a resuscitation of a style indigenous to the climate, and precisely suited to the materials which we have at hand; but here the suitability, for the present day, pretty nearly ends. While our climate is almost unchanged, manners and habits both of thought and life have been nearly revolutionised among us; and the Mediæval style—the offspring of a *furor* of religious asceticism no longer in the nation at large, and showing, moreover, in its grotesque adjuncts, and in what Ruskin has happily termed its partially "wolfish" expression, the impress of a rude though powerful age—is no representative of the more civilised manners and broader culture of the present day. Apart from climatic considerations, the Italian Renaissance style reflects more truthfully the modern feeling and tone of English society. It is to an intuitive perception of this that we must attribute the phenomenon, which has much puzzled sundry indignant Goths, of the general sympathy of the Liberal or "progress" party in politics with what is called "Classic" architecture. The Conservative and Ecclesiastical party, on the other hand, are nearly all ranged, by a similar instinct, on the side of Mediævalism. It is well that the public mind should be brought to see the true state of the case on this head, and that the present Mediæval revival is no less a passing fashion, has no more element of permanence in it, than any other of the architectural fashions of the last three or four hundred years. It has the same radical defect as the others—viz., starting with the assumption that a certain style is to be imitated, instead of considering first what are the circumstances and needs to be provided for, and building accordingly. The mischief is more than a mere æsthetic one. A building once erected represents an outlay of money which cannot readily be replaced. Consider the cost of labour and material employed of late years on the building of churches alone. The total for twenty years back must be a very large sum; and when the present ecclesiastical mania subsides, what will there be to show for it? A set of buildings, imitations (many of them bad ones) of other buildings of the same class erected five hundred years previously, and which can apparently be of no possible use when the sentimental impulse which demanded them has passed away. That the said impulse should prove a permanent one is surely of all things the most improbable, considering the variable tendency of human thought and feeling in the present day. Such temporary revivals of the religious forms of a past age are familiar enough to students of history, though they have not often got themselves embodied in stone and mortar to such a wasteful extent. We are about, too, to erect an immense building for our Law Courts, under the direction of an eminent architect whose talent no one will question, but whose sympathy and connection with the ecclesiastical party have been conspicuously made known, and under whom the whole exaggerated ecclesiasticism of the day is to be stereotyped in visible form and feature in this great civic building, which will last as a piece of important national property long after even the memory of the present attempt at clerical predominance has passed away. It is probably too late to protest; but it is really a matter for regret that a great public work should thus be made the sport of a passing fashion, of which it ought to be totally independent. Of course we are not advocating a return to the Classic Renaissance, which would only be passing from one sham to another. All we plead for is to see the true principle of architectural design restored—that of making the requirements and purposes of our buildings the basis of their design, instead of starting with a certain class of design as a foregone conclusion, to which the building is to be made to fit. This, as we have already hinted, is the principle lying at the root of all true architectural styles. So with the use of material: the most important distinction (very little comprehended) between the Gothic and the Renaissance is that the former uses all materials in the most natural and suitable manner, and makes the collocation and arrangement of material really a part of the picturesque of the architecture; whereas the Renaissance ignores the nature of the material and the manner of working it, and most Renaissance designs, such as our modern club-houses, would look just as well as models carved in the wood or alabaster as they do in the reality. What are

* From *Fraser's Magazine*.

called very "handsome" buildings can be made in this way when there is plenty of money to spend; but for economical and unpretending structures this style is nowhere. On the other hand, a style which depends for effect upon the truthful and expressive use and picturesque collocation of the materials at hand may be as effective, in its way, in a humble street dwelling-house as in a mansion or a town-hall; and this, which is really and truly the Gothic principle of working in architecture, may be exemplified *ad infinitum* without any copying of the ordinary figures of Mediæval architecture, or any assumption of the ecclesiastical character. How this may be accomplished it would be perhaps difficult, certainly out of place, to point out here in detail; but one thing the non-professional public may do towards giving fair play for such a system of architectural design. Let them give up, once and for ever, the popular idea that a building must needs resemble something else belonging to another time or country; let them no longer go to their architects with requests for schools and churches in the "Gothic style," for theatres and banks in the "Classic" ditto; let them state their requirements to an architect in whom they have confidence, and leave him to give appropriate architectural expression to the building which is to meet these requirements, unfettered by precedent, and there will then be some chance of a truthful and characteristic modern style of architecture getting itself into shape among us.

Concerning the influence (before hinted at) of political systems on the architecture of a country, much might be said, and to the point, but the subject would carry us too far afield. It is almost impossible to touch upon it, however, without remarking how uniformly architecture seems hitherto to have attained its grandest developments mainly under despotism of one kind or another, ecclesiastical or monarchical. The cathedrals and abbeys of religious orders, the palaces and cenotaphs of kings, and other great works undertaken to glorify a reign—such are its chief trophies. We will not say, therefore, that architectural splendour necessarily depends on such despotism, powerful to labour for its own fancied aggrandisement. We will rather say that power and education are slowly passing from the hands of the few into those of the many, and that architecture is likely in future to be less concerned with great and isolated works, more with the amelioration and adornment of the mass of structures rendered necessary where human families most do congregate. We are, to be sure, at present in a state of transition, and little enough has been done in this direction as yet. In one class of buildings, which have multiplied of late years, and where there would seem to be scope for much of appropriate delicacy and grace of architectural treatment—country dwelling-houses—we are lamentably deficient; meanness and vulgarity of design, or more often absence of all that can be called design, characterising a majority of such erections. That this is so is at least as much the fault of the public as of the architects. The author of an able and voluminous work on the "English Gentleman's House," whose professional practice has led him specially into that branch of architecture, has recorded his experience, that in nearly all cases the said English gentleman has a rooted objection to all attempts to give individuality of style and character to his mansion or its adornments, apparently from a confused notion that it is "vulgar" and "pretentious" to aspire to differ from your neighbour in such matters. We fear the statement is only too correct; nor are matters mended if we appeal to the English lady.

Surely that is no vulgar or commonplace ambition which seeks to render the home round which all tender and pleasant associations are to eluster itself an object of pleasurable contemplation and suggestion; to make it, not a mere harbour against the weather, with a neat and respectable exterior, but a thing of gracious and inviting aspect, with its light and shadows, its corridors of "grateful gloom," its gaily-lighted and decorated festal apartment, or its retired angles for meditation. We may take a lesson in such tastes from our little people; it is pleasant and interesting to see how children, taking possession of a new house, hail with delight any little bit of out-of-the-way invention therein—any bay, arcade, or balcony, which gives them a point of interest to cluster round, breaks the monotony of dead walls and square apartments, and becomes thenceforth a part of their daily life. It is good not to lose all our childish tastes. Nor shall we forget the passers-by, who will give us their benediction for placing in the midst of their favourite landscape a dwelling which, instead of being a blot and an eyesore thereon, a manifest intruder, shall rather seem, from its position and outline, the one picturesque feature to complete the view. An

"English home" may be all this, and yet be none the less, in Tennyson's exquisite phrases

"The haunt of ancient peace."

And our towns! By what magic are we to evolve anything of rest or pleasure to the eye or mind from these dreary miles of brick and acres of slate, with a dim canopy of smoke overhanging the whole? We have at last a national style, which is really the style of the people; architecture in towns has got into the hands, as we remarked, of the many; and the many are, unluckily, not educated or refined enough to care to do anything with it. Our streets are, in the main, at the mercy of the speculating builders, whose ideas of architecture range no higher than those of our old friend Balbus in the Latin Exercises, who "built a wall." If Balbus had knocked a few oblong holes in his wall besides, he would then have realised the modern ideal of street architecture. Surely we may be justified in inquiring whether it is not possible for human beings to congregate together in communities, without of necessity surrounding and environing themselves with such an aggregate of utter and unredemmed ugliness, making day hideous. Can we not attain the pleasure and convenience of living in societies without paying the penalty of spreading desolation and gloom around our steps, as if in fulfilment of the denunciation, "Cursed be the ground for thy sake"? How far it may be possible, with time and thought and science, to render the regions where men assemble ("the meeting-place of souls," as Mrs. Browning called our chief city) abodes not only of healthfulness but of beauty and dignity of aspect, we will not undertake to say; probably much more may be done in this direction than most persons at present would imagine possible. But at least there is no need that we should be subject to such dire monotony, such utter absence of interest and expression in our street houses and shops as at present exists. Improvement in this matter will not, certainly, be attained by flanking doorways with "pilasters," or dabbling over the front of a "property" with perishable ornament, of a degraded type, in stucco. Permanence, stability, and truthfulness are among the first requirements of architectural expression. The mere unpretending employment of the best and most durable materials available, put together in most substantial manner, and with a certain picturesque variety (not too quaint or forced), in the outline and arrangement of roofs and windows, would do wonders with the aspect of our streets, in comparison with what it is at present. The class of buildings which form the bulk of town streets—shops—offer in their usual arrangement and requirements at once an opportunity for architectural expression and effect. The characteristic feature of a shop—the open ground story, with plenty of light for displaying the goods—is now made the occasion for the most absurd possible falsity of design, the rage for an expanse of plate glass being such that every apparent support for the superstructure is scouted, and our shops present the appearance of being built on a basement of glass, the only real support being the concealed iron column in the rear, which often very inadequately sustains the superstructure. If there be one instance stronger than another of the extent to which architecture is an index of social character and manners, it is in the coincidence between the spirit of hollow profession and puffing and ostentation characteristic of our trading classes, and the flimsy dishonest structures which they erect to recommend their traffic from. Were shopkeepers, as a class, once content to rest for success on real excellence and honesty of work, instead of ostentatious rivalry in display and advertising, we should be able to have a shop architecture in which the ground story, designed to furnish sufficiency of light without ignoring stability, would afford scope for much new and picturesque treatment. Those who are familiar with the "Rows" of Chester can conjecture one form which such street architecture might assume—a form which might be a source of pleasure to all with an eye for the picturesque; for (to borrow Browning's phrase) "we are made so that we like" contrast and play of light and shadow, in buildings as well as in nature. There is room, too, for architectural effect of the highest kind in our larger and more ample thoroughfares, were it attempted in the right way. There would be few architectural effects finer, perhaps, than might be afforded by Regent's Quadrant, were it flanked by a really fine design instead of by commonplace in stucco. Such ensembles, however, are not likely to be attempted until the public and the Government of this country awake to the idea that mere beauty in public streets and buildings may be something worth having and paying for as a national possession. We are a good way

from this now, if we may judge, among other things, from the feeling and expressions evoked during a Parliamentary discussion a year or two back with reference to the sum to be expended on the greatest building of the day, before alluded to—the New Law Courts. On that occasion not only did persons high in office scout contemptuously the idea of spending more money than was just necessary to make a habitable building, but all the speakers in the debate, without exception, though among the most cultivated of our Parliamentary representatives (including one or two who are supposed to take a special interest in art), thought it necessary studiously to disavow any interest in the architectural aspect of the question, and to repeat, with "damnable iteration," their solemn declaration that they only wished to consider the subject "as ratepayers," and "from a practicable point of view." In other words, when a great building is to be erected, which, if worthily carried out, would be one of the glories of our capital, a "πῶμα ἰσχυρὸν" for the nation, and a centre of interest for foreign visitors, we are to haggle over the attempt to cut it down to the bare necessities of walls and roofs; and those who think the architectural aspect of such a work a matter of some importance actually dare not avow their feeling, for fear of being ridiculed. That is what we have come to.

It is in the hope of inducing a more adequate appreciation of the subject on the part of some at least of those who have not hitherto given any consideration to it that the foregoing attempt has been made to indicate, in a brief and general manner, the leading principles and object and bearing of architecture, or the art of expression and character in building. We look on the amelioration of town architecture in this country as the problem of the modern architect. We have had the age of palaces and of cathedrals—of the feudal and ecclesiastical type of social organisation. The age of the cathedral is past, and we have now to provide, not a feudal or ecclesiastical, but a federal architecture—to bring the art home "to men's business and bosoms," and to adorn and dignify the every-day commercial and domestic life of the people at large.

ART TRAINING SCHOOL AT SOUTH KENSINGTON.

THE Central National Art Training School at South Kensington has now closed for the summer vacation. The following are some of the results of the instruction given in the annual report of the Science and Art Department just laid before Parliament:—Forty students in training and 13 national scholars have received allowances of from 10s. to 40s. per week; six students in training have been appointed to masterships of Schools of Art. As a normal school the number of the students of all classes who paid fees during the year was 565 males and 429 females—total 994. The amount of fees was £2,623 14s.; of this sum £442 12s. was paid by "evening" students only, and the balance £2,181 2s., by day students. The fees have increased over those of the preceding year £38 18s. The number of individual students has increased from 835 to 994. In this number are included 114 artisans, 14 schoolmasters, and 17 schoolmistresses. The schools were open 205 days during the year; the smallest attendance recorded was 171, on the opening day; the largest, 460, on February 4, 1870. The total number of attendances recorded for the whole year was 60,959, and the average daily attendance 297. The results of the annual examination in 1870 were as follows:—Of certificates of the third or highest grade 13 were taken, seven first or elementary being obtained by students not then in receipt of allowances. At the national competition three gold medals, two silver medals, six bronze medals, six books or Queen's prizes, and 13 third grade prizes in the elementary stages, or local prize section were won by students of the male school. Four silver medals, four bronze medals, six books or Queen's prizes, and 28 third grade prizes in the elementary stages, or local prize section, were won by students of the female school. These results have been exceeded during the year just completed, so far as the number under instruction is concerned, while the fees paid have increased from £2,623 to £2,821. The schools will re-open on the 2nd of October next, when all new candidates for admission will be required to pass, or to have passed, an examination in freehand drawing.

The *Concordia* of Rome announces that in the excavations made in the Palace of Monte Citorio, with the object of completing the edifice destined for the Chamber of Deputies, there has been found a colossal torso in white marble, representing Hercules, with a lion's skin over the shoulder.

IMPROVED INDUSTRIAL DWELLINGS COMPANY (LIMITED).

THE report and statement of accounts of this company, to be presented at the sixteenth half-yearly meeting of shareholders, to be held at the Mansion House this day (Friday), show that at the date of the last report the share capital amounted to £125,000, and new £10 shares of the value of £72,220 had, at the 30th June, been taken up. On these the sum of £1 per share has been paid, making the total subscribed capital £132,220. Since the 30th June, shares to the value of £1,500 have been taken up, and the new shares unallotted amount to £51,280. The loans applied for to the Public Works Loan Commissioners amounted at the date of the last report to £80,000, and of this sum £52,000 has been received.

£15,493 9s. 1d. has been expended on works in progress. The total expenditure on capital account is now £195,779 16s. 7d. The rents during the half-year amount to £8,444 1s. 3d.; and dividend on railway stock, &c., make the total income £8,662 6s. 1d. The total expenditure, including the contributions to the leasehold redemption funds and repairs account, has been £4,370 1s. 10d., leaving a profit of £4,291 19s. 3d. Of this amount, £294 5s. 5d., repaid to the Commissioners during the half year, has been carried to the Public Works Loan redemption fund; and the balance—viz., £3,997 13s. 10d.—added to the balance (£2,697 14s. 1d.) brought forward from last half-year, gives a total of £6,695 7s. 11d. available for dividend. The directors recommend that the usual dividend, at the rate of 5 per cent. per annum, free from income tax, be paid, which will absorb £3,224 8s. 3d., and that the balance, £3,470 19s. 8d., be carried forward.

There having been a large number of empty dwellings in one of the Company's blocks at Derby Buildings, Kings Cross Road, in which only one scullery, &c., was provided to every three dwellings, the directors have, by throwing two dwellings into one, provided separate domestic conveniences to each dwelling in the block, and these dwellings are now all let. This result only tends to confirm the principle on which the Company has on every other occasion acted—viz., to provide every tenant with complete and exclusive use of all the necessary accessories to a home, such as water supply, copper, coal-place, water-closet, &c., the tenants gladly paying a higher rent for the better accommodation.

Since the last meeting the directors have negotiated for leases of three important sites. The first is in George-street, Grosvenor-square, granted by the Marquis of Westminster, on which a block of dwellings is being erected to contain accommodation for 38 families; the second is in Goswell-street (Compton-street and King-street frontages), Clerkenwell, granted by the Marquis of Northampton, on which two blocks of dwellings are being erected to contain accommodation for 48 families; and the third is in Crab Tree-row, Shoreditch (near Columbia Market), granted by the Baroness Burdett Coutts, on which five blocks of dwellings are being erected to accommodate 112 families. These buildings are being erected by Messrs. Allen & Son, of Tabernacle Walk, Finsbury, and when completed will afford accommodation for about 1,000 persons. The total cost will be about £32,000. It is hoped that a portion of the dwellings will be ready for occupation at Christmas next. The directors are also in negotiation with the Marquis of Westminster for the lease of an additional site in Ebury-square, Pimlico, which will enable the directors to extend Ebury-buildings, and give additional accommodation for about 300 persons.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

LEICESTER AND LEICESTERSHIRE ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.—On Monday week, a meeting of members of the above society was held in the Town Hall Library, the Rev. J. H. Hill, F.S.A. (of Cranoe) presiding. The minutes of the last meeting were read and confirmed. A statement of receipts and disbursements on account of the publications of the society (prepared by Mr. North) was read. The receipts amounted to £150 5s., the payments to £118 12s. 2d.—leaving a balance in hand of £31 12s. 10d. Captain Whitby exhibited various plates from Nichols's History of Leicestershire. Rev. J. H. Hill exhibited an engraving of St. Veronica, consisting of one continuous line only. It was executed in 1619 by Mettano. Mr. James Thompson exhibited a ring tobacco-stopper (supposed date, time of Commonwealth), an old copper coin of uncertain date and country, and an apocryphal inscription of the name of Robin Hood and a date upon it.

SURREY ARCHÆOLOGICAL SOCIETY.—The annual excursion of this society was made on Thursday week. The members and their friends assembled at

Guildford, and proceeded by train to Baynards, on the Horsham and Brighton Railway, where they entered vehicles for the day's drive. The first halt was at Rudgewick Church, in the walls of which are a number of Roman bricks, supposed to have been removed from some Roman villa destroyed by fire, their appearance fully warranting that conclusion. The church was described by Mr. W. W. Pocock, of Guildford. The next drive was to Alfold, the site of an ancient forest. At the old church an interesting paper was read by Mr. R. Nevill. From Alfold a drive of a few miles took the excursionists to Cranleigh. From the church the party proceeded to Cranleigh County School, in one of the halls of which Mr. J. Park Harrison gave some interesting information concerning the old Roman road which passed from Ewhurst to Farley Downs, the course of which he traced, and which will in future be indicated on the maps of the Ordnance Survey. Farley-heath, on which the Easter Volunteer Review of 1864 was held, has long been designated as the site of a Roman settlement, and the discovery of this old roadway confirms the supposition. Mr. Godwin-Austen read a paper on the Manor of Shere and Vachery, from information furnished by Mr. Reginald Bray. Mr. Austen expressed an opinion that Cranleigh derived its name from the cranes, which at one time were plentiful in England, and were served up at most winter feasts. After leaving the school, the party proceeded to a meadow belonging to Mr. A. Napper, at Cranleigh, where luncheon was served beneath a tent. Mr. J. G. Nichols, F.S.A., presided. The usual toasts, including "Success to the Surrey Archæological Society," were drunk, and a great increase of members was announced. A move was then made to the Cranleigh Railway station, whence, at seven o'clock, a special train conveyed the archæologists homewards.

KENT ARCHÆOLOGICAL SOCIETY.—On Wednesday week the annual gathering of the members of this society took place at Knole Park, near Sevenoaks. The business meeting was held in the fine baronial hall at Knole House. Earl Anherst, in opening the proceedings, congratulated the members on being able to assemble in such a beautiful and magnificent hall, so full of historical and archæological memories. The meeting he was glad to see was a large one, and could vie with some of the earliest and most successful held by the society. The members were increasing in numbers, and their funds were in a very satisfactory condition.—Earl Stanhope having been elected president for the day, then took the chair, and read the report, which stated that the society was in a flourishing condition. The balance at the bankers amounted to £517 15s. 5d., a sum more than sufficient for the expenses of the 8th volume of the society's proceedings "Cantiana Archæologia," now very shortly to be issued. This would be found a good and valuable addition to the series. Twenty-two new members had been elected during the last year. They had, however, to lament the loss of several valued friends, and amongst them Mr. C. Wykeham-Martin, of Leeds Castle, always a kind and active promoter of archæology.—The Rev. W. A. Scott-Robertson was elected as joint honorary secretary with Mr. Godfrey Faussett.—Several new members were nominated and elected, amongst whom were the Deans of Canterbury and Rochester, Mr. P. Wykeham-Martin, M.P., &c.—The Rev. W. J. Loftie read a paper on the history, architecture, and furniture, &c., of Knole House, which he said was one of those museums of architecture with which the rural parts of England peculiarly abound. In London no considerations of archæology had weighed to preserve buildings which had lost their use; but when they came to such a place as this, where land and even houses, as in the case of Knole, were measured by acres rather than by square feet, they found houses like that under whose ample roof they were assembled, in which, when one part was antiquated and unsuitable to modern requirements, another part was built, the original not being removed; and a succession of distinct and distinguishable buildings, each in itself an architectural monument, were allowed to grow up side by side without pushing each other out of the way. Thus they would find at Knole specimens of every style which had prevailed in England for the last four hundred years, and covering six acres of land. So far as could be discovered, the earliest part of the existing house was erected by Archbishop Bouchier, who must have pulled down or disguised the remains he found of the residence of the preceding owners. The hall in which they were assembled was entered by a colonnade, over which was a large shield of the arms of Lionel Cranfield, Earl of Middlesex. The colonnade was placed there as a kind of porch in the reign of William III., whose bust was on the ends, reminding them of the colonnade in the inner court of Hampton Court. The hall was, as usual in buildings of the period, divided by a screen at one end, a minstrel's gallery being over the screen, and the passage leading to a small inner court had the kitchen and kitchen offices on the left hand and the doorway to the hall on the right. Among the various crests on the screen were leopards rampant, and rams' heads, which seem to have been used by the Sackvilles as crests. The shields on the windows were those of Robert Devereux, Earl of Essex, of Queen Eliza-

beth, of Vere, Earl of Oxford, of three Sackvilles, and the arms of Bouchier. Knole House was many times visited by Henry VIII. and Elizabeth, besides other monarchs. If they went outside, and stood with their faces towards the house, they would see the Gothic buildings of the archbishop on the right. The square towers were very fine. At right angles stood the stables; the upper story of this part was of the Tudor period. It still bore the name of the King's Stable. The portion of the house right in front was composite in character. The lower part was early; the upper bore more distinct traces of Elizabethan and later work. Further towards the south the Stuart period comes in distinctly, and then they had a window which was probably inserted after 1700. The kitchen of Archbishop Bouchier's time was in fine preservation, but the present kitchen was considerably smaller. At the extreme west end was the chapel and a chaplain's room. The chapel extended north and south instead of, as usual in ecclesiastical edifices, east and west. There was a vaulted crypt, which although latterly used for the warming apparatus of the neighbouring conservatory, and full of rubbish, would well repay a visit. The north-east side of the chapel contained windows which looked into the organ-room, where one of the oldest organs in England was to be seen. The principal objects of interest were as follows:—The staircase, which is Elizabethan or Stuart, and the carving of the banisters deserves attention. The brown gallery, 88ft. long; in the windows are to be seen the Prince of Wales's feathers and the Tudor rose. It contains some very old furniture. Lady Betty Germaine's room is remarkable for its panelling, the doorway, an antique warming-pan, and some Mortlake tapestry representing Vandyke, the painter, and Crane, the master of the works. The Spangled Bedroom—a stool, probably of the sixteenth century; bed furniture, said to have been presented to the Earl of Middlesex by James I., ebony cabinet, seventeenth century; Venetian mirror. The crimson drawing-room has a beautifully-carved chimney-piece, silver fire-dogs, and tongs. The King's or Silver Room—a bed prepared for James I., said to have cost £8,000, with furniture of gold and silver tissue; two silver tables, masterpieces of their kind; ebony and ivory cabinet. Other rooms were also worth visiting—viz., the ball-room, the cartoon gallery, the dining-room, the billiard-room, the Venetian bed-room, &c. There were no fewer than eighty staircases in the whole of the buildings, which would give them an idea of the intricate labyrinth of rooms and passages. The best view of the house is obtained from the rose garden, on the west side. The pictures with which the walls of Knole House are literally covered were elaborately and ably illustrated and explained by Mr. G. Scharf. The company, after going over Knole House, proceeded to the Crown Hotel, where they dined together in a pavilion erected for the purpose.—On Thursday the members assembled at Sevenoaks started on an excursion to several localities of interest in the neighbourhood. The first place visited was the Oldbury Camp, which covers the vast area of 137 acres. It is supposed to be an encampment of the ancient Britons, and British gold coins and many flint implements (described by Sir John Lubbock) have been found on the spot. The party proceeded from here to Ightham to look at the church, which contains some fine old tombs and monumental brasses. Wrotham was the next place, and the church well repaid the excursionists for the time taken in reaching it. It has been lately restored, but as near as possible in the style in which it was originally built. The architecture is of the Decorated period, and owing to the unusual number of chapels it at one time contained, there are no fewer than three piscines in the side aisles, besides one in the chancel. It also can boast of a nave gallery, looking both into the nave and chancel. The font is a genuine Early English one, and the doors are of the same style. Another peculiarity is that it has an exterior passage under the tower from side to side. At Wrotham the Archbishop of Canterbury once had a palace, but very few vestiges of it now remain. The Rev. C. Lane, the rector, kindly provided luncheon for the archæologists, numbering upwards of 200. An ancient Manor House, called "Old Sore," the Cromwellian Church of Plaxtole, and the Mote, the residence of Major Luard-Selby, were likewise visited. The meeting this year has been not only a very satisfactory but a most pleasant one. The weather was delightful, and the country through which the excursionists drove is not to be surpassed for picturesqueness or richness in all England.

ROYAL GALLERY OF ILLUSTRATION.—MR. AND MRS. GERMAN REED'S ENTERTAINMENT.—A new entertainment, written by Arthur Sketchley, will be produced at this place of amusement, Monday, August 14th. *A Sensational Novel*, in consequence, has been withdrawn, after a run of 186 performances. The success of *A Sensational Novel* may fairly be attributed to the clever satire of Mr. W. S. Gilbert, and the admirable manner in which the present entertainment is sustained by Mr. and Mrs. German Reed and the talented company at their command.

PARLIAMENTARY NOTES.

STOREY'S-GATE.—Mr. B. Hopo gave notice that on going into committee of supply he would call attention to the construction of the carriage-road at Storey's-gate, and ask for explanations as to why so large an amount of public money was expended with such inadequate results.

THE NATIONAL GALLERY, &c.—Lord Overstone moved, on Tuesday, for returns of the total amount expended on account of purchases for the National Gallery from the date of its commencement to the present time; the total amount expended during the same period on account of the annual cost of the establishment and other outgoings; the total amount expended on building account; a similar return in all respects as regarded the South Kensington Museum; a similar return in all respects as regarded the National Portrait Gallery; and a similar return as regarded the British Museum, from the commencement of the year 1821 to the present time.—Ordered.

METROPOLIS WATER (No. 2) (RECOMMENDED) BILL.—This bill passed through committee, with a number of verbal and unimportant amendments on several of the clauses.

CHURCH BUILDINGS ACTS AMENDMENT BILL.—This bill was read a second time.

THE NEW ROAD TO STOREY'S GATE.—Mr. Goldsmid on Wednesday asked the First Commissioner of Works whether he could now make arrangements for throwing open to the public during the recess the new road through the park to Storey's-gate.—Mr. Ayrton said that he must direct the attention of his hon. friend to some papers that had recently been laid upon the table on this subject, which showed that it was not in his (Mr. Ayrton's) power to make arrangements upon the subject. His hon. friend would see in the papers that the sanction for opening the road was given by a board that controlled him (Mr. Ayrton), and that it was to be kept open simply to enable hon. members to perform their duties to the public more conveniently. He himself had no power to make any arrangement beyond that purpose. Any such arrangement could be made only by Her Majesty's Government, with the sanction of Her Majesty.—Mr. Goldsmid: But could not that sanction be obtained?—Mr. Ayrton: That was a much larger question than the one on the paper, and therefore he was not prepared without previous notice to answer it.

METROPOLIS WATER BILL.—This bill, as amended, was considered, and one or two further unimportant amendments made in it.—The bill was then read a third time and passed.

CHURCH BUILDING ACTS AMENDMENT BILL.—The Lords' amendments in this bill were considered and agreed to.

Building Intelligence.

CHURCHES AND CHAPELS.

BRADFORD.—On Wednesday week the corner-stone of the new chapel and schools which are to take the place of Sion Chapel, Bridge-street, was laid. The chapel and schools, designed by Messrs. Lockwood and Mawson, architects, Bradford, will be in the pure Italian style, the principal feature in the front to Harris-street being a projecting Corinthian portico, with sculptured pediment. The body of the chapel will measure 80ft. by 68ft., and will seat 1,200 adults. Behind are the spacious schools. One general school-room on the ground floor will be 73ft. by 32ft., infants' room 3ft. by 26ft., and ten class rooms. On the upper floor is a lecture-room 40ft. by 32ft., ladies' sewing-room 33ft. by 22ft., and library 22ft. by 18ft. The total cost of the scheme, inclusive of land, will be upwards of £15,000.

CHURCH WORK IN WEST DEVON.—Church restoration, says the *North Devon Herald*, is making great progress in the west of this county. Last year the neat little church of Ilalwell was thoroughly restored, and now we learn that the sacred edifice in the adjoining parish of Beaworthy is approaching completion, and is expected to be re-opened in the course of the coming month. The pretty little church of Ashbury is being also rebuilt at the sole expense of the Venerable Archdeacon Woolcombe. We are likewise informed that the old and very dilapidated church of Germans-week will shortly pass into the hands of the contractors. This undertaking, together with the appeal for help made on behalf of the parish of Bulkworthy, we strongly recommend to the sympathy of Churchmen.

DENTON.—On Monday the foundation-stone of a new Wesleyan Chapel was laid at Denton. The design of the chapel, which has been prepared by Mr. G. B. Ford, of Burslem, is Gothic. The ground plan is a simple parallelogram. The materials to be used in the building are pressed red bricks, relieved by

bands of blue Staffordshire bricks and Yorkshire stone dressings. The exterior dimensions, including portico and orchestra, will be—length, 91½ft.; and breadth, 40ft. 8in., exclusive of buttresses. The chapel will afford accommodation on the ground floor for about 400 persons, and there will also be a gallery which will accommodate 255 children.

HEBDEN BRIDGE.—The corner-stone of a new Wesleyan chapel was laid at Old Town, a short distance from Hebden Bridge, Lancashire, on Saturday. The plans have been prepared by Messrs. Russel & Whittaker, of Rochdale, and the cost of the building is estimated at £1,500. The edifice will consist of a school on the ground floor, 18 yards by 12 yards, and over this will be the chapel, which will be in the Gothic style of architecture, and will seat nearly 300 people. The chapel will be built of Yorkshire stone, with dressed facings.

LIVERPOOL.—Fabius Baptist Chapel, Liverpool, has been opened. It is a neat building, the style adopted being that of Northern Italy, colour being judiciously used by having red pressed bricks in front with white brick dressings. The chapel is arranged to accommodate about 550 persons on the ground floor, and it is high enough to admit of galleries being erected when required, so as to give, ultimately, seat-room for 1,000 persons. The cost is about £2,200. The architect is Mr. Wilson Penney. The builder is Mr. Thomas Hughes.

MANCHESTER.—The foundation-stone of the new church of St. Martin, in German-street, Oldham-road, Manchester, was laid on Saturday last. The church consists of a lofty nave and chancel, with side aisles. A tower with slated spire is placed at the corner of German-street and Primrose-street. The main gable is finished in Pierre Point walling, with red knucorn stone dressings to windows, doors, &c. The style of the architecture is a mixture of Early English and Early French. The church will accommodate 500 or 600 persons. The contract has been let to Mr. James Ilerd, of Cheetham, Messrs. Scarlett Brothers doing the stonework, and Mr. Higgins the excavating and brickwork. Messrs. Price and Linklater, of Manchester, are the architects.

NIGG.—The foundation-stone of a new U.P. Church at Nigg, N.B., has been laid. The new church which is to be built on the site of the old one, has been designed by Mr. Alexander Ross, architect, Inverness, and is in the Norman style. The plan is a parallelogram, with a square tower rising at the west end. The building will be seated to accommodate 500 people, and is to cost about £1,200.

UPTON HELIONS.—The church of Upton Helions, Devon, has lately been undergoing restoration, having been in a rather neglected condition. The floor has been newly laid, and the arches divested of numerous and successive coatings of whitewash. A font replaces a mere shallow marble basin that stood on a pedestal. The removal of the whitewash, &c., from the porch has resulted in the restoration of a pretty Norman structure. A gallery having been removed and a vestry made, have further added to the improvements. A place in the chancel for the choir has also been made, and a small choir formed. In this chancel there is also now a neat altar and fittings, and above it a stained east window, containing three lights.

BUILDINGS.

BRADFORD INFIRMARY AND DISPENSARY.—The Board of this Institution are about to have erected a range of buildings on the west side of the Infirmary, to serve the purposes of a dispensary, and to afford better accommodation for the patients and officers. Plans were prepared by Messrs. Andrews and Pepper some months ago, and after mature deliberation, the works have been let for about £4,500. Owing to the land falling towards Westgate, it required skilful treatment to add a wing to the old building without marring its appearance. The architects have, however, been successful in this particular. The dispensary will be joined to the old structure by an enclosed stone corridor. The same style of architecture will be followed out. The front to Westgate presents a handsome elevation of two stories, with pinnacles at either angle, four other pinnacles of more ornate design, and an ornamental parapet surmounting the central portion of the building. The east end of the Infirmary, now used as a dispensary, will be converted into an accident ward.

DEANSATE, MANCHESTER.—Deansgate is one of the oldest streets in Manchester, and for many years has, notwithstanding its contracted width, been compelled to afford accommodation for a very large traffic. The importance of the thoroughfare and the amount of traffic, however, became so great

that the Corporation of Manchester resolved to buy up sufficient property to widen the roadway from about 25ft. to 60ft. This is being done for a distance of 490 yards. Barton's Buildings, the property of John Hope Barton, Esq., are the first which have been commenced on the new line of frontage. The ground appropriated for the new buildings has a frontage of 177ft. to Deansgate, by an average depth of 100ft. Below the street level an excavation will be made to a depth of 25ft., down to the red sandstone rock, thus allowing for two depths of cellars. On the street level there will be an arcade 226ft. in length, by a width of 15ft., with shops on each side, having two entrances from Deansgate and one from Red Lion-street, S. Ann's-square. Above the shop or ground floor storey, three storeys for offices and show-rooms are to be built, and the arcade will be widened to 25ft., and at a height of 53 feet above the street level the whole of the arcade will be covered in with an ornamental iron and glass roof. The building will be constructed with fire-proof floors, roofs, and staircases. The roof generally will be flat, and the rooms in the attic or upper central portion are intended as residences for the office keepers and their families, a certain amount of the flat roof being attached to the dwellings as yards for drying-grounds, &c. The contract for the excavation, brickwork, drainage, &c., for the sub-basement and basement has been let to Mr. William Hensley, contractor, of Salford, near Manchester, for the sum of £1,663. The total cost of the buildings is estimated at about £25,000. The works are being carried out under the superintendence of Messrs. Corbett, Raby, and Swyer, architects, Manchester.

EVERTON.—The foundation-stone of the national schools to be erected in connection with S. Saviour's Church, Everton, was laid last week. The new building has been designed by Mr. G. E. Grayson, architect, of Liverpool, and will be in the Gothic style. It will be built of brick, with stone facings, at a cost, including the price of the land, of nearly £5,000. Accommodation will be provided for 750 children. The contractors are Messrs. Holme and Nicol.

OPENING OF A NEW BRIDGE AT NOTTINGHAM.—On Tuesday week, at Nottingham, was opened a handsome new bridge over the Trent, superseding the old one, which has done duty for centuries. The old bridge, which had an extreme waterway of 275ft. containing, in all, fifteen arches, has been considered for many years past in a somewhat precarious state, but it was not until 1863 that plans for a new structure were definitely adopted. The design for the present bridge, the estimated cost of which is £31,000, was the sole work of Mr. M. O. Tarbotton, C.E., the borough surveyor. The total length of the bridge is about 700ft., the clear width between the parapets is 40ft., and from face to face of the abutments 48ft. 8in., being practically the same width as Southwark and Waterloo bridges, London. The height of the roadway above the summer water level of the Trent is 27ft., and there are two footpaths each 7ft. wide, with a carriage-way 26ft. wide, capable of accommodating easily three lines of carriages. The three main arches, or spans, are each 100ft. wide in the clear. The surface of the bridge is quite level, and the north approach has a gradient of 1 in 47 and the south 1 in 34. The material of the large main arches is cast iron, and each arch has eight ribs or girders, which weigh about 200 tons. Details of the ornamentation in Darley Dale, Mansfield stone, and Aberdeen granite need not be given, but the general effect is good. Eight coats of arms sculptured on the abutments have been selected for the purpose of typifying some of the principal events which connect the old bridge and the town of Nottingham with the general history of the country, and have been supplied by Mr. Thos. Close, F.S.A. Messrs. Benton & Woodiwiss, of Derby, were contractors for the general building and masonry work; Messrs. Andrew Handyside & Co., of London, for the ironwork; Messrs. Mawer & Ingle, of Leeds, for the general carving; and Messrs. Marshall, of Nottingham, for the painting and decoration.

THE PRINTERS' ALMSHOUSES.—The suburb of Wood-green was on Saturday afternoon the scene of a ceremony of considerable interest to the printing trade—namely, the opening of the new wings to the Printers' Alms-houses. The inauguration festival was presided over by Earl Stanhope. The inadequacy of the establishment to its requirements having been long felt, about nine months ago the foundation-stones of the two wings opened on Saturday were laid. The two wings cost together £3,334, and are pleasant and handsome structures in the Domestic Early English style, the architect being Mr. Charles Bell, of No. 51, Strand, and the builder Mr. W. Henshaw, of the City-road.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

RECEIVED.—Mrs. B. W. H., W. H. Lynn, G. T. R., S. S., M. B. A., O. W. D., C. S., M. E. & Co., J. F., H. S.

A. W. S.—Nash & Hull, of 202, High Holborn, supply enamelled letters.

RICHARD ARNOTT.—What did you write about at first?

T. S. SMITH.—Thanks for the cuttings from newspapers; but, not having the necessary dates affixed, they were impaired in value.

A. HARTSHORNE.—The Albert Dürers safe to hand.

Correspondence.

STAINED GLASS AT THE INTERNATIONAL EXHIBITION.

To the Editor of the BUILDING NEWS.

SIR,—In your journal of the week before last, in commenting on the stained glass at the International Exhibition, you mention the window, "No. 2376 (south-east staircase) central window by Messrs. Gibbs." How such a blunder could have taken place I am at a loss to imagine, as my name appears somewhat prominently underneath the window, thus:—"Charles A. Gibbs, Stained Glass Works, 148, Marylebone-road, London, N.W." My reason for drawing your attention is that my window is not exhibited in the name of Messrs. Gibbs, and if you would kindly correct the error, I should esteem it a favour.

You also say that my window is "an effect of painting in elaborately stippled and softened enamel." This would infer that the whole of my window is enamelled. This is not exactly so; the style of the window is a new introduction of my own, partly enamels and pot metals. More of the latter would not have suited the style of my window, which is purely Renaissance; it is a subject of Christ blessing little children, surrounded with a framework of pilasters of architectural work, fruit, flowers, &c. The deviation in the working-out of this window is that I have avoided garish colouring, adhering to neutral tints, golden yellows, white, &c., forming in the whole a combination of flat tinting, and of delicate hues, from its peculiar treatment and novelty of its shading, &c.—I am, &c.,

CHARLES A. GIBBS.

[We gladly give Mr. Gibbs an opportunity of correcting the error; but he appears not to be aware that we merely copied from the official report as prepared by Mr. T. Gambier Parry.—ED.]

THE CRITICS OF THE NEW LAW COURTS.

SIR,—There are people in the world who are so well satisfied with themselves, and so full of their own perfection, that they are constantly endeavouring to bring everybody up to their high standard by offering publicly their gratuitous criticisms, opinions, and advice. In the architectural profession these characters abound. The latest, and perhaps the most marked specimens of this kind of self-sacrifice for individual and the general good may be advantageously examined by referring in your valuable paper to the two productions on the New Law Courts written respectively by Mr. Fergusson and Mr. E. W. Godwin. The first savagely attacks what he calls a "vault," meaning the central hall in Mr. Street's plan. What he says is blurted out in a most unqualified manner. There is no attempt at making his vigorous blows feel like compliments. He strikes out in a very unmistakable fashion, little caring for the feelings of the gentleman he is trying to punish, and at the same time taking care to show that he is indignantly disgusted with the New Law Courts in general and with Mr. Street in particular.

Mr. Godwin next comes on the scene. It is intolerable to him that another should attempt to oust him from the high place which he has assigned to himself in the public estimation, and accordingly he asserts himself by scolding his rival, blistering him with ridicule, showing his incompetence, accusing him of gross misrepresentation, and, under cover of the fable of the "Fox and the Grapes," charging him—nay, crushing him—with the sin of envy. This

is, no doubt, very gratifying to Mr. Street. But if Mr. Godwin had stopped here he would have been untrue to himself, his class, Mr. Street, and the public. He has demolished Mr. Fergusson; he must now give us something to replace what he has destroyed, and with becoming modesty he points out as our fitting guide Mr. Godwin. No straightforward blundering this time; skill and the science of hitting hard, not unnecessarily hard, in vital parts are studied and practised in the matter. Mr. Street, he tells us bluntly, is too strong a man not to take as oracular the advice of so very unprejudiced a professional gentleman as Mr. Godwin. How conciliatory! Strong men are to be feared, and the wisdom of softening their anger is apparent. At last the great man's opinion is announced, not blusteringly, but with a quiet emphasis that shows he is on the ground he considers to be exclusively his own. No hidden feature of the building would suit his perfect touch. The principal front and nothing else can be worthy of his pen, and he condemns the design so gracefully, yet so utterly, that its most enthusiastic advocate could scarcely find it in his heart to gainsay the words, however opposed he might be to the opinion they convey. Between Mr. Fergusson, Mr. Godwin, and the Press, many people are beginning to think that Mr. Street is the wrong man to design Law Courts. If he is the strong and able man he is represented to be, it is to be hoped he will immediately give us an example of what he can do in the way of putting down the busybodies who are trying to get themselves prominently before the public by condemning his work and frittering away his reputation.—I am, &c.,

READER.

THE NEW NATIONAL GALLERY.

SIR,—I have no desire to be "funny" on any subject, and Mr. Redgrave is in error if he supposes that such an important matter to the profession as the designs for the new National Gallery would be selected by me on which to bestow "facetious" comment. It was the prompting of an earnest feeling to see our important public buildings worthily treated that caused my remarks on his or Mr. Layard's design—whether or not such design was published without the permission of the author or authors matters little—there it is, and must be taken on its merits; and Mr. Redgrave must pardon me if I express an opinion that the fact that such as it should have been published by authority of Parliament, must be most damaging to the architectural profession. It is just this sort of thing that lessens in the eyes of certain honourable members, and of the public, the ability of architects generally, and helps to cause that disrespectful tone in which they are sometimes spoken of.—I am, &c.,

W. W.

SELENITIC MORTAR.

SIR,—Your correspondent "P. E. M." has either a very slight knowledge of chemistry or a very poor memory. There is evidently some strange confusion in his mind between two acids ending in "ic"—carbonic acid and sulphuric acid.

My invention has reference to the employment of the latter of these acids, and not of carbonic acid, as he supposes.

If he will again refer to my patent, and compare it with Professor Kerr's words, which he quotes, he will have reason to regret his having written to you on a subject with which he had made himself so imperfectly acquainted, and I trust that he will attempt to remedy the mischief which even random assertions produce, if made in an influential journal.—I am, &c.,

HENRY Y. D. SCOTT.

Kensington, August 8.

COLONEL SCOTT'S SELENITIC MORTAR.

Sir,—In your last week's number, a correspondent ("P. E. M.") states that Selenitic mortar is much the same thing as Mr. Westmacott's composition, described by Professor Kerr in a paper on "Artificial Stone," as consisting of "common lime and sand, to which is added a certain proportion of uncalcined carbonate for the mere supply of carbonic acid." "P. E. M." says the basis of the two is the same, "induration by the aid of carbonic acid." I have no practical acquaintance with Mr. Westmacott's "artificial stone," but I have with Col. Scott's Selenitic mortar, and therefore beg leave to correct "P. E. M." and to inform him, and others interested in the subject, that Selenitic mortar does not contain uncalcined carbonate of lime, and that its hardening properties are not derived from the presence of carbonic acid. Selenitic mortar is composed (like other mortars) mainly of freshly-burnt lime and sand, with the addition of a small proportion of sulphate of lime. These materials are mixed or compounded in a peculiar manner, and on this

mixing the excellence of the mortar in a great measure depends. The effect produced by the addition of the small quantity of sulphate of lime or plaster of Paris is something astonishing, and has not yet been satisfactorily accounted for. I have a theory of my own on the subject, but as I have not thoroughly worked it out I abstain from troubling you with it.

"P. E. M." also mentions Ellis's patent of 1857, for making artificial stone, and says that the invention is "something of the same kind" as Col. Scott's Selenitic. I have carefully read the specification of Ellis's patent, and can confidently state that that there is not the least resemblance between the two processes. It is quite evident that "P. E. M." is totally unacquainted with the composition and properties of Selenitic mortar, and I should recommend him, before writing any more on the subject, or endeavouring to instruct others, to carefully study Col. Scott's specification, which he can procure at the Patent Office for a few pence.—I am, &c.

66, Chancery-lane,

August 10, 1871.

W. E. NEWTON, C.E.

SCULPTURE AT THE ROYAL ACADEMY.

SIR,—My attention has been called to your article of June 16th, on the "Sculpture at the Royal Academy," and I beg to thank your correspondent "H. O." for the very flattering mention that he makes of my bust of Gladstone therein. At the same time, I feel bound to tell "H. O." that I should have attached more value to his praise had he displayed a better knowledge of sculpture and sculptors than is set before us in the following:—"Mr. J. S. Westmacott's diminutive 'Eve Listening to the Serpent' (1907) differs but in a slight modification of the attitude from the celebrated 'Eve at the Fountain,' by the artist's father."

The above passage contains two blunders, each being perfectly inexcusable in a writer who undertakes to write a critique on a public exhibition for a popular journal.

Mr. J. S. Westmacott is a nephew of the late Sir Richard Westmacott, R.A., and the celebrated "Eve at the Fountain" was the work of the late E. H. Baily, R.A., as the merest tyro ought to have known, for Baily's "Eve" is spoken of as familiarly as Kiss's "Amazon," or Foley's "Boy at the Stream," or any other famous work whose name is always linked with the name of the artist. What makes the blunder still worse is, the father of Mr. J. S. Westmacott was not a sculptor, and his uncle never executed a statue of "Eve at the Fountain."—I am, &c.,

N. N. BURNARD.

36, Hugh-street, Eccleston-square, Pimlico, S.W.

August 6th, 1871.

THE PROFESSION.

SIR,—A great deal has been said lately upon the overcrowded state of the architectural profession, but it strikes me that the correspondents do not get at the root of the matter. My theory is, that the stinginess of some of our architects has very much to do with it, many of them being contented—or professing to be contented—with inferior draughtsmanship at low salaries and plenty of arted pupils, really good draughtsmen being looked upon as expensive luxuries, not to be indulged in except in rare instances. By this means a large number of inefficient are drawn into the profession, to the exclusion of better material.

Take an example:—A term-expired pupil of a late eminent architect (an excellent draughtsman, and prizeman of South Kensington) comes in contact with a colleague of his late master, who magnanimously offers him a desk in his office (without salary), "the unprecedented opportunities for improvement" which he will thus enjoy being far "superior to any amount of pecuniary remuneration." He accepts, and is accordingly installed, his vocation being the tracing of plans and printing of titles, varied occasionally by journeys to the post-office, and "doctoring" of instruments. After enduring this for some time, he ventures to suggest that a higher class of work would be preferable, he is told that it is all "practice," and is reminded of the "unprecedented opportunities," &c.

Now, I do not say this is the general rule, there are a few exceptions—unfortunately, very few; but, in the great majority of cases, these are the "chances" of improvement which an art-loving student has in a London office, and can we wonder that such men quit the profession, and that its ranks are recruited by those only who have no more artistic feeling in their souls than there is in a brass button.

JAY.

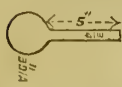
August 7th, 1871.

THE CEDARS OF LEBANON.—Mr. Jessup, an American missionary, has recently discovered several extensive groves in Lebanon. Of these there are three of great extent in Southern Lebanon. The grove lately contained 10,000 trees, and had been purchased by a barbarous sheik from the Turkish Government, for the purpose of trying to extract pitch from the wood. The experiment, of course, failed, and the sheik was ruined, and several thousand trees were destroyed in the attempt. One of the trees measured 15 ft. in diameter, and the forest is full of young trees springing up with great vigour.

Intercommunication.

QUESTIONS.

[2280].—**Iron Beam.**—Will one of your scientific



beam, which is peculiar, as sketch. There is no top flange.—M. A. B.

[2281].—**Taking out Quantities and Measuring up Work.**—Is there any book that will guide you in taking out quantities and measuring up builders' work generally, in accordance with the system adopted by London surveyors?—INQUIRER.

[2282].—**Colours Used in Drawing.**—Can any of your correspondents kindly inform me what colours are generally used in architectural drawing to represent Kentish rag and Bath stone?—PUPIL.

[2283].—**Priming.**—I want to know whether priming is considered to be one coat when woodwork is described to be painted four oils, or whether this description is generally taken to mean four coats besides the priming? Perhaps some reader can enlighten me, and oblige.—W. R.

REPLIES.

[2145].—**Burning Clay.**—The process is described in Papworth's edition of Gwilt's "Encyclopedia of Architecture," 1867 (page 530). A more detailed statement of the process of burning will be found on page 2 of a journal which was only in existence for six months (in 1865), entitled *The Illustrated Builders' Journal*. It does not state how the article was obtained, which is one that might well be reprinted in your own pages. Clay thus burnt or baked should be well done, otherwise it soon becomes deteriorated by wet and traffic. At no time is burnt clay, or ballast, as it is often called, so good as sound brick rubbish or rough gravel. In new-made roads in some of the suburbs round London it has been laid down in forming the foundation for roads and paths; and, when rammed up by cart-wheels, it has been mixed with a little lime for mortar and plastering. In some places it has been ground up in a mortar-mill with plaster rubbish, with or without any fresh lime, and very wretched mortar it makes, especially when the fresh lime is totally omitted. It has been apparently used with some advantage in making Portland cement concrete.—A. T.

[2273].—**Plaster Work.**—"A Young Builder" must be guided by the custom of the locality in which the work is executed. Deductions are assuredly made for all openings—in some places entirely; in others, for material only; being measured for labour in others. Again, half the opening only, for labour and material are deducted, which virtually amounts to about the same as the last-mentioned. With regard to cornices, both external and internal mitres (angles) are allowed for, and either included in the superficial amount as one foot lineal of cornice, or priced at the same rate. In some localities, all above four are allowed; in others, all.—F.

LEGAL INTELLIGENCE.

OVERCROWDING WORKROOMS.—Madame Philipe, dressmaker and milliner, of No. 72, New Bond-street, was summoned at Marlborough-street recently by Dr. C. J. B. Aldis, medical officer of health for St. George's, Hanover-square, for having a workroom so overcrowded as to be injurious to health. Dr. Aldis stated that he visited the defendant's premises on the 1st of June, and found eighteen persons at work in the front workroom. The room only contained 2,046 cubic feet, which only allowed 112 cubic feet to each person, and on the 18th of July he visited them again and found seventeen persons at work, which allowed 118 cubic feet to each person, instead of 300 cubic feet each. In the back workroom there was also overcrowding, more persons being employed therein than there ought to be. He considered such a practice to be dangerous to the health of the workpeople. He had heard that two of the workpeople had suffered in them; and had cautioned the defendant. In every other respect the place was properly conducted. For the defence it was stated that the overcrowding was unintentional, and had arisen through sudden pressure; that the defendant's husband, who was a foreigner and unacquainted with the law, had taken another workroom; that there should be no further cause of complaint, and that Dr. Aldis's caution had never reached him. Mr. Mansfield made an order for the cause of complaint to be abated; requested the defendant's solicitor to explain the matter to his client, and ordered the defendant to pay 12s. 6d. costs.

ALLEGED FRAUDULENT SALE OF A BRICKFIELD.—At the Maidstone Assizes, on Saturday week, the trial of the Rev. W. English, vicar of Dunmannel Church, Camberwell, on an indictment for obtaining a valuable security, under false pretences, was brought to a close. The charge arose out of some transactions which Mr. Peter Bawden, brickmaker and patentee of brickmaking machines, of Nottingham, and was fully detailed in the *Building News* for March 17 and March 24 last (pp. 211 and 234).

Vol. XX). The jury, after several hours' deliberation, were discharged without coming to a verdict.

THE POWERS OF LOCAL BOARDS OF HEALTH.—An important action came before Mr. R. Wildman, at the Doncaster County Court, last week, in which Mr. Stephen Atkinson, chemist and druggist, Doncaster, sought to recover a sum of £30 from Messrs. Pearson & Son, contractors, of Bradford, being £23 6s. for value of certain sanitary pipes removed, and £6 11s. amount of surface injury in removing the same from a field, his property, in March-street, Doncaster. Mr. Chambers, of Sheffield, appeared for the plaintiff, and Mr. Cave, barrister, for the Corporation of Doncaster, who, as the Local Board of Health, were the real defendants. It appeared that the field had originally been the property of the Board of Health and the common-right owners, and a public drain was made through to an outlet beyond. Subsequently the property was purchased by the Cemetery Commissioners, and conveyed to them by special Act of Parliament. They in turn sold it to Mr. Atkinson, the present plaintiff, to whom it was conveyed without reservation. Last year, in the course of constructing the new drainage works, the Board of Health determined to abandon this old sewer, and the contractors were directed to take up the sanitary pipes. It was for this that the action was brought. Mr. Chambers now contended that the conveyance to Mr. Atkinson being without reservation these pipes were clearly his property, the sewer having been abandoned and superseded by another, and the contractors had no right to enter his land for the purpose of removing them. Mr. Cave, on the other hand, submitted that by the 45th section of the Act of 1863, the Local Board had power to alter or destroy any existing sewer, after notice to that effect, and upon this the defendants had acted. A jury had been summoned to try the case, but as it transpired that the defendants had paid £6 11s., the claim for surface damage, into Court, the question resolved itself into a point of law, and the jury were discharged. His Honour decided that the pipes had been legally removed, and were the property of the Local Board, and gave judgment for the defendants.

STATUES, MEMORIALS, &c.

STATUE OF THOMAS GRAHAM.—Mr. William Brodie, R.S.A., has just completed the full-size model in clay of a colossal statue, to be erected in Glasgow, of the late Thomas Graham, Master of the Mint. The statue is to be cast in bronze, and is to occupy a position at the south-east corner of George-square, corresponding with that of Chantrey's celebrated figure of James Watt at the south-west corner.

COLOSSAL MARBLE GROUP OF AFRICA.—This group by Mr. Theed, which is to form one of the principal features of the Prince Consort Memorial in Hyde-park, is now practically complete. Egypt has been adopted as the centre of the group, and is personified by the figure of a woman habited in the costume of the ancient statues of the country. She is represented as about to descend from a dromedary which has already been made to kneel, as at the completion of a journey, thus signifying that the ancient civilisation of which she is the type has come to an end. On the right of the central group is the figure of a Troglodyte, or inhabitant of the desert lying between the Nile and the Red Sea, indicating the utmost eastern limits of the continent, and near to him is the half-buried statue of a sphinx, a remnant of the monumental glories of the past. On the same side of the central group, but further round, is the figure of European Civilisation instructing a chief of one of the tribes of Southern Africa, whose rapid attention is suggestive of the dawn of rising civilisation. On the left of the central group the present commerce of the interior and the northern shores of the continent is personified by an Arabian merchant seated on the ground, in the fashion of his country, by the side of his merchandise, which consists of bales of cotton, minerals, vegetable drugs, elephants' teeth, and other native productions.

MEMORIAL TO THE LATE REV. W. B. MACKENZIE.—The designs of Mr. S. Dutton Walker, F.S.A., of Nottingham, have been selected by the committee for erecting the monuments proposed to be placed in St. James's Church and Schools, Holloway, London, to the memory of the Rev. W. B. Mackenzie. The design for the memorial proposed to be erected in the chancel of the church is pure Greek in style, the church itself being in that character. The monument will be constructed principally of French stone of a very fine white quality. The inscription tablet will be Sicilian white marble, and a simple pure white marble cross wreathed with a crown of thorns occupies a panel in the upper part of the monument. The whole is very richly carved with pure Greek ornament, the details of which have been expressly designed by the architect. The other memorial to be erected in the school-room will be of a more simple character, in the Decorated Gothic style, with trefoiled headed tablet and spandrels and richly-carved headmould. The execution of the work has been entrusted by Mr. Walker to J. Birnie Philip Esq.

Our Office Table.

THE NEW MARKET FOR ROTHERHAM.—Some time ago plans and designs for a new market for Rotherham were advertised for by the Rotherham and Kimberworth Local Board of Health, and the announcements were responded to by six competitors—namely, Messrs. Hill and Swann, of Leeds, and Bow-street, Sheffield; Mr. Rees, of London; Mr. Blackmoor, of Rotherham; Barry and Sons, of Liverpool; Mr. Marsden, of Sheffield; and Mr. Thomas Dobb, of Rotherham. The plans have been before the Board, who selected the first three named for choice by Mr. Worthington, of Manchester, the architect the Board called in to advise with them. Ultimately, the plan of Messrs. Hill and Swann was selected.

THE LONDON AND COUNTY BANKING COMPANY.—At the half-yearly meeting of this company held on the 3rd inst. the report presented to the shareholders was of the usual satisfactory character. A dividend of 6 per cent, with a bonus of 3 per cent. for the half year, was declared, being at the rate of 18 per cent. per annum, £1,449 17s. 4d. being carried forward to profit and loss new account.

ENORMOUS FALL OF GRANITE AT THE MOUNT-SORREL QUARRIES.—On the 7th inst., a large blast of gunpowder was fired at these well-known quarries, attended with very remarkable results. The cliff, which may be seen from the Midland Railway between Barrow and Leicester, standing boldly up 100ft. in height, and many hundreds of yards in length, was pierced about 40ft. from the ground by a deep bore hole, and 450lbs. of powder secured therein. When the blast was fired the whole face of the rock came away together, with scarcely any other sound than the crushing of the rock in its fall. The quantity thrown down is estimated at 20,000 tons, and is by far the largest weight of stone ever before moved by one blast at these granite quarries.

APPLICATION OF THE FACTORY ACT TO THE BRICK-FIELDS.—In view of the approaching application of the Factory Acts to all brickfields, Mr. G. Smeed, the largest brickmaker in England, and Mr. E. R. Ray, the certifying surgeon for one of the most important brickmaking districts, express the result of their experience on the subject. The provisions of the Factory Act, they say, have for the space of two years been strictly and universally carried out in the Kentish brickfields. They have been found already to be productive of much good to the workpeople, and to have caused no unreasonable inconvenience to the employer. They most strongly recommend their application to all brickfields, no matter how few the number of hands employed therein.

THE INSTITUTION OF CIVIL ENGINEERS.—During the last three months the changes which have taken place in this Society include the election of 4 Members and 18 Associates, the transfer to the class of Members of 4 Associates, and the admission of 5 students. In the same period the deaths have been recorded of 1 Honorary Member (Sir John Herschel, Bart.), 2 Members (Mr. Newlands and Mr. Suermont), and 16 Associates (Captain G. Baillie, Mr. O. Dadian, Mr. T. W. Gardner, Mr. H. De La P. Murphy, Mr. R. Ritchie, and Mr. C. Wilks.) There are now on the books 15 Honorary Members, 730 Members, 1,059 Associates, and 205 students, making together 2,009, against exactly 1,000 on the 30th November, 1862, so that in less than nine years the gross number has been more than doubled.

Chips.

The Lytham Cottage Hospital, illustrated in the *Building News* a few months since, has just been opened.

A new Wesleyan school has been opened at Longwood, near Huddersfield, at a cost of £600.

The church of St. Clement Danes, Strand, it is said, is marked out for demolition. On Monday, in a consultation between the Chancellor of the Exchequer, Mr. Street, and other authorities, it was decided that its removal was necessary for the approaches to the New Law Courts, at last actually in course of erection.

The foundation-stone of a new lighthouse was laid on Monday at the Longships, off Land's-end. The lighthouse will be 116ft. above high water, and the light will be seen at the distance of sixteen miles.

The whole of the gas for the city of London will shortly be supplied from the new gasworks at Beekton, and arrangements have just been made that the appointment of examiner of this gas shall alternately be exercised by the Board of Works and the Corporation, the latter body to have the first nomination.

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 18, 1871.

PLANTS ADAPTED FOR ORNAMENT.

IN pointing out a few English plants which might be turned to good purpose in design, we are by no means committing ourselves to the naturalistic, as opposed to the conventional school. On the contrary, the best use to which, for ornamental purposes, the study of Nature could be applied, would, as we think, be the development thereby of new conventional types. The old ones, repeated with very little variation on almost every fresh building as it arises, are becoming worse than wearisome. It is true they have their merits: they are often well executed, and show considerable breadth, and spirit, and effect. But it is possible to work a good idea to death, and instead of falling back perpetually and for all purposes on the French or English architects of the thirteenth century, our carvers might by this time venture to think for themselves. Retaining the vigorous and simple handling of the first Gothic period, let them carry on the work where it was left off: let them give us a conventional rendering, not merely of the half dozen plants which have been conventionalised before, but of the scores of others which are equally susceptible of a bold and monumental treatment.

The foliage of our own Early English capitals is said to be derived from that of the *Geum rivale*, or water avens. The resemblance, however, is by no means close, and the plant is so uncommon in many parts of England that it could hardly have been the original of the universally-distributed ornament of the period. Its leaf is indeed a trefoil one, the foils being flattened at top, so that its outline does approach to that of the ornament it is supposed to have suggested. This outline, however, is by no means peculiar to the avens, and is found in greater beauty and perfection elsewhere; while the bold stems, deep grooves, and crisp curling lines of our First Pointed capitals are entirely an addition on the part of their designers. If they imitated one particular plant in the outline of the leaf, they imitated in the stems the upspringing curves of strong vegetation generally: their work was not a tame repetition of a single example so much as a copy of the ways by which Nature everywhere marks life, freshness, and growth. The same thing may be said, with still greater reason, of the designers of most Early French foliage. Their acanthus leaves roll and curl over in a way which no living acanthus could do more than faintly suggest, and their *crochets* spring with a breadth of stalk never seen even in the strongest natural shoots. Their work is not an attempt, as hopeless as absurd, to copy, perhaps in a coarse sandstone or a shelly oolite, the endless serrations and half invisible edges of natural foliage; it seeks to retain such qualities as can be retained, and frankly abandons the pursuit of the impossible. And it does more than this. Feeling that visible and apparent strength is the first necessity in such features as a capital or a corbel, it looks about to see how Nature expresses strength, and adopts the same means in a higher degree. It first simplifies the type of foliage it selects, for the sake of the material; it then strengthens it, for the sake of constructive propriety. These two things chiefly make up what is called conventionalism; and, keeping them in mind, we may safely venture on new ground, and explore fields which our predecessors never found time to visit.

For the purposes of the carver, plants might be divided into two classes, those with simple and those with compound leaves. Of the latter the acanthus is, of course, the commonest type. In England we have others in several species of thistle, especially the great

milk-thistle, which abounds in the marshes by the Thames near Gravesend. But there are still better ones to be found on a smaller scale. Some of the commonest weeds which we tread underfoot—the groundsel, and dandelions, and sow-thistles—if only enlarged sufficiently, will furnish excellent ideas for ornament. As M. Viollet le Duc has remarked, it is not the largest trees, or even the rankest vegetation, which supplies the most striking and spirited models. Forms infinitely better adapted for a vigorous and monumental style grow all around us, and we pass them by simply because they are so small. Copy them five or ten times the natural size, and we have at once almost a new conventional type, and by no means a bad one. A great number of composite plants have these acanthoid leaves, some of them with pointed, others with rounded, others again with variously scalloped segments. They may be found by almost every roadside, especially towards the autumn, and for the mere trouble of gathering and examining them we may obtain most valuable suggestions. Leaves like these, in which the different divisions are all connected by a membrane, are generally more useful in ornament than those in which they spring from little separate stalks. The latter can hardly be much simplified without entirely destroying their individuality, and yet they are too complex to be repeated as they are. Such are those of the hemlock, the wild parsley, and the umbelliferous group in general. If they have a place in architecture at all, it should, perhaps, be either in delicate surface ornament, or in metalwork. Like the majority of our ferns, whose beauty has so often tempted designers into failures, these doubly and triply winged plants are beyond the reach of art. Those which only have one order of leaflets, like the clover, the wood-sorrel, and the cinquefoil, may sometimes be studied with advantage, but even these are most serviceable in flat carving. They vary considerably in outline and expression. The wood-sorrel has three heart-shaped leaflets, joined by their points. In the common clover they are oval, and in the hare's-foot trefoil nearly round, in the wood anemone pointed and deeply cleft, in the corn crow-foot triply pointed, and in the cinquefoil almost wedge-shaped. Of single leaves, elaborately cut, the most remarkable, perhaps, are those of the wild geraniums and erodiums—the crane's-bills and stork's-bills. In English Decorated work, like that at Southwell Minster and elsewhere, these were favourite models for the carver. The general outline, in most species, is kidney-shaped; in other words, the prominences fall in a curve which completes about seven-eighths of a circle, but which, instead of finishing it, suddenly turns back into a sharp, long hollow, into which the leaf-stalk enters. The rounded surface inclosed by this outline is broken up into either five or seven segments, by narrow incisions reaching nearly to its centre, and the edge of each segment is further frilled by obtuse notchings, three or four in number. But of all seven-cleft leaves perhaps the most beautiful is that of the *Alchemilla*, or lady's mantle; and this we have never seen imitated by the carver. Its general outline is much like that of the crane's-bill, but the incisions are not nearly so deep. They divide its edge into obtusely-pointed arches—five of the regular shape, and two, at the bottom, with double points. But no description can give any idea of the remarkable gracefulness of the form, which is increased by the fan-like way in which the younger leaves fold themselves up, and by their rapidly-diminishing size as they ascend the stem. The plant, which has a little umbel of greenish-yellow flowers, may be found in shady pastures in most parts of the country. The common hawthorn exhibits another of these deeply-marked simple leaves, and the maple a rather more regular one. There is a little species of speedwell—a small

creeping plant with a blue flower, common in ploughed fields in the early spring—which has a three-cleft leaf full of character and beauty, and which well deserves to be noticed. Its general outline may be called kidney-shaped, but the curve is flattened and widened out, and the surface is nearly twice as broad as it is long. There is a shallow and delicate hollow taken out of it on each side; the central segment has a flat curve at top, changing below to a very quick one; while the side segments have a flat curve on one side opposed to a sharp one on the other. These beautifully-contrasted curvatures, and their smoothness and regularity, make this little example much more architectural in its effect than natural examples generally are, though it would, of course, require to be considerably enlarged. The ground ivy, again (*Glechoma hederacea*), is worthy of examination. Its leaf-outline is heart-shaped, with bold elliptical scallopings. The catmint (*Nepeta cataria*) comes nearer to a spherical triangle in shape, and has ogce-shaped toothings. The ivy-leaved snapdragon—a little purple-flowered creeper, frequent on old walls in damp situations—has a beautifully-divided leaf, superior, for the purposes of ornament, to that of the ivy which gives it its name. The granulated saxifrage—an upright white flowering plant, common on railway banks and old chalk pits, has a very noticeable leaf, of the kidney-shaped class. Another one, of the same type, but cleft into three nearly wedge-shaped segments, may be found in a species of buttercup which grows in marshy places, and which produces two entirely different forms of leaf on the same plant. This curious propensity is also manifested by another of the buttercup genus, the *Ranunculus hederaceus*, which exhibits, perhaps, the most perfect outline of any of our ivy-leaved plants. This one grows in ponds and ditches, and its foliage, when developed under water, consists of a mere tuft of hair-like filaments. But the leaves which float on the top are of quite another sort. They are small, but beautifully curved, much wider than they are long, and divided into five obtusely-pointed segments, of bold and strongly characteristic shape. Even in still simpler leaves than these there is much variety. The forget-me-not (*myosotis*) has a long outline of graceful reflexed curvature, which might suit a Greek vase. The dead-nettle leaf, at first sight, looks heart-shaped; but it is really concave on one side of its point and convex on the other. The privet is obtuse towards the stalk, and acutely-pointed at the opposite extremity. The common scabious, and a number of other plants, are just the reverse. The violet has an elegant cardioid outline, and the black bryony a similar but more elongated one. Certain wild species of campanula have a leaf almost like an isosceles triangle, with the two lower angles rounded; but straight lines are rare in nature, and in this case one side will be found slightly swelled out, and the other delicately hollowed. Some varieties of the field convolvulus have a rounded leaf cut off almost square at bottom, and the large white convolvulus has a somewhat arrow-shaped one. But a water plant, the arrowhead (*Sagittaria sagittifolia*), goes much further in this direction, its leaf running down into two long sharp barbs, which flank the stem, and drawing upwards at the top into a stiff though somewhat convex point.

Speaking generally, it is not the very simplest any more than the most intricate forms which will be found of the greatest use for ornamental purposes. It is those whose form is most strongly marked by firm, regular, and characteristic outlines. But outline is far from being the only thing that requires attention. We might even say that it is scarcely even the principal thing. The light and shade on the surface, the texture, the folds, and the markings, above all the turns and convolutions which express growth and development, are amongst the vital points to be retained. To take a leaf, whether well

or ill-adapted for ornament, and then flatten it out and draw or carve from it, is the least likely way to obtain a good result. The plant must be watched as it grows, its foliage must be studied as Nature presents it. Looking at it in this way, we shall find very little of it spread out smooth and straight, like a dried specimen. It is turned at every possible angle, twisted into every conceivable shape. Some of it appears to us edgeways, some foreshortened and point first, some hangs down and shows the leaf stalk, some springs back and exhibits the underside, some is rolled up like a corkscrew or folded like a fan, or bent in and out in all manner of puzzling ways; and the man who thinks he is imitating Nature by plastering a few flat leaves against a flat capital can never really have studied the Nature he professes to imitate. As a rule, the best leaf forms will be found in the spring, when vegetation is young and strong, and the best plants from which to select them amongst the smallest and apparently the least promising of our common weeds.

ILFRACOMBE AND ITS NEIGHBOURHOOD.

THE entrance to Ilfracombe Harbour is strikingly picturesque, from the manner in which an ancient chapel (dedicated, as usual in such localities, to S. Nicholas, the patron saint of sailors) crowns the ridge of slate rock known as the Lantern Hill. This chapel has long been desecrated, and has served for thirty years as the residence of the widow woman who still occupies it; but we learn with extreme regret that both hill and chapel are doomed, and the widow has had notice to quit, in order that a new pier and lighthouse may be constructed, and the harbour improved. Our professional judgment, however, is greatly at fault if it be absolutely necessary that this sacrifice should be made. There seems ample room for any pier that could be required by the removal of the part of the slate ridge beyond the old chapel, and certain it is that the town will lose much in effect by the destruction of this ancient landmark, which, in miniature, resembles, in point of outline, the famed St. Michael's Mount of Cornwall. If the demon of modern improvement must be propitiated, we should like to see a mariners' church take the place of the present dilapidated structure, which has no recommendation in point of architectural detail, or in aught save its outline and position. The town of Ilfracombe seems to possess nothing else noticeable in the way of antiquities except its venerable old church. It has sprung up in obedience to the very recent demand created by the advantages of the place as a seaside watering-place; and the best that can be said of it is that the natural irregularity of the character of the ground has prevented it assuming the usual monotonous and disagreeable appearance with which speculating builders usually contrive to endow such miniature towns.

The following description, which we quote, well shows the process in this instance:—"The town of Ilfracombe was built after the fashion of all Devonshire towns and villages; and the process, which is as follows, is a natural and therefore a simple one. A farm-house, and a few labourers' cottages attached to it, are erected by the side of a bridle-path, or a cross-country road; the farm prospers, and the cottages are multiplied; gradually a shop or two appears; for the sake of the roadway the village increases in length in either direction; there is a landing-place by the sea, surrounded by a few fishermen's hovels, and a church (placed generally in the centre of the parish) on a hill; these extremities at last are joined by the lengthening street; isolated houses are dotted about on the hill-sides; the cottages are replaced by substantial buildings; a new street is formed; terraces are built; a quay is constructed; a new church upreared; walks are made in all directions; steamers

and coaches appear on the scene, and from the manor of Alfridseona, the hamlet of Ilfordcombe becomes the rising and flourishing watering-place of Ilfracombe."

Thus it is that the houses clamber up hill sides, and cluster into the several combs in a pleasantly scrambling style, and frequent gardens interspersed, and an apparent love of flowers and shrubs on the part of the inhabitants combine to form an attractive whole. A good deal of public spirit on the part of some individuals has been displayed in laying out the ground in the neighbourhood, and developing its very great natural beauty. Walks have thus been arranged along the tors, and tunnels made to give access to some of the bays on the shore, and this work seems to have been carried out with unusual judgment and taste. The ancient church, dedicated to the Holy Trinity, deserves attention. It is well situated on one of the isolated knolls that rise in the centre of the large valley in which Ilfracombe may be said to be placed, and surrounded by an amphitheatre of higher hills than any of those which lend diversity to its own surface. The structure is a large one, 115ft. long, by 61ft. broad, and consists of three long compass-roofed parallel aisles, without special division externally or internally between nave and chancel. We notice that this character obtains generally in seaside places, and with judgment, as the limited height caused by having no clerestory gives less obstruction to the wind. A tower projects nearly midway from the side of the north aisle (that towards the sea), and gives a fine effect to the structure from all the principal points of view from which it can be seen. There are also north and south aisles. The tower is Norman, slightly tapering upwards, with Perpendicular battlements and pinnacles. Transitional and Decorated architecture are represented in the building; but the greater part is Perpendicular, with large traceried windows in that style. There are some good Decorated pinnacles, but the principal feature to be noted is the roofing of the nave. This is of the waggon or barrel ceiled type, with ribs to about every third rafter. To each rib there is a quaint stone grotesque animal as a corbel, and an angel carved in wood stands upon each corbel. The effect of these is very striking, and they may, perhaps, represent the virtues dominating over the vices; otherwise the presence of such exceedingly grotesque animal forms inside the edifice is not easily to be accounted for, and they would certainly appear more in place as gargoyles upon the outside. The whole of the nave roof has also longitudinal ribs intersecting the vertical ones; the three easternmost bays are more highly ornamented, each square compartment inclosed by the intersecting ribs having also diagonal ones, and a carved strawberry-leaf enrichment follows each side of each rib, and each intersection has boldly-carved bosses. The colour of all this woodwork is black with age. The aisles have ceilings of the same form, but plain, and the moulded ribs are thinner and mean in comparison with those of the nave. The chancel has a modern open-timbered roof, with some traceried panels, but of a heavy and clumsy character, which contrast painfully with the old work, which, though unusually large and bold in style, and vigorous in carving, is not coarse, as is this newer woodwork.

The condition of the church has been well cared for. We wish we could say we entirely approve of the manner in which it has been done. The architecture itself has not, as far as we can see, suffered under the hands of the restorer; its simplicity of character has not been marred, but all the furniture and woodwork generally, as some screen between the chancel and its aisles, are but of mean and meagre design.

A new church, dedicated to SS. Philip and James, has recently been built in the lower part of the town, and has a district

appointed to it out of the parish of Ilfracombe. This is a work exhibiting throughout great care; the detail is of good character, in the Decorated style, and the design is of moderate excellence. Mr. Hayward, the diocesan architect, was the architect employed. The tower is finished with a high slated roof, in lieu of a spire, banded somewhat regularly, and otherwise than pleasantly, with purple and green slates.

A large and ambitious hotel, of pretentious but indifferent architecture, has been erected near the last-named church, and has a good view of the sea, and a good space of ground around it laid out as gardens; and we may aver with confidence that it affords facilities for visitors to sojourn luxuriously, at no immoderate cost, in a thoroughly charming locality. Ilfracombe is well situated as a centre from which to make excursions to all parts of the Bristol Channel, and the scenery in every direction is bold and diversified.

A little to the north of Ilfracombe lies the village of Hele, in which we noticed a new school-room, which we liked exceedingly. This is a simple, modest parallelogram, with a small bell turret, a four-light mullioned principal window, piquant in character and good in proportion, well placed in the gable end, and a wooden framed porch at the side. These few details well treated have produced a very happy result.

Continuing the same route by the road which skirts along the edge of the cliff, Watmouth harbour is reached, and Watmouth Castle, the residence of A. Bassett, Esq. This is a pseudo-castellated structure, built about the commencement of this century, of which the less that is said the better, save that its site and surroundings are charming in the extreme. From this spot may be seen the tower of Berrynarbor Church, situate about a mile inland, up a lovely valley. The church will be found one of great interest, and the tower almost unique, the finest of a group of four in this neighbourhood, which have many points of resemblance. The four are those of Combe Martin and Berrynarbor, Arlington, and Kentisbury. Berrynarbor church, consisting of two parallel aisles, has work of Norman and Early English date, with Perpendicular additions, and its superb tower is Perpendicular. This feature is very plain in the lower stages, but has a good west doorway and western window. The buttresses are not placed exactly at the angles, but on the sides, a little distance from the angles, and are carried up rectangular on plan to the string-course under the parapet. Above this they are set diagonally, and the junction concealed by pairs of carved animals, treated as gargoyles, and this diagonal portion dies as a pinnacle against the parapet, above the coping of which the finial alone rises. The true angles of the tower having no projection up to the parapet string-course, at that level a grotesque corbel carries a rectangular pinnacle, with sides parallel to those of the tower, and this rises clear above the parapet. The parapet is battlemented, but with a long, plain portion at each side, against which the diagonal pinnacles die as before mentioned, and the central space between these is divided into the aforesaid battlements, which have three openings, and an open quatrefoil enriches the upper squares left between the returned coping. We regretted not to find near the churchyard a monastic house which existed there some time ago, and which was decorated with many carved and moulded features in stone, and with the arms of Plantagenet and Bonville, but we learned that all these features have been removed to ornament some garden summer-house by a late proprietor.

Combe Martin is the next village on the route, a long, straggling street of houses, stretching inland from the bay of the same name. As we passed along this street in search of the church we met with two Domestic details which arrested our attention; not less by their forlorn look than their high intrinsic

merit. The first of these was a rectangular bay window to a cottage of delicate wooden construction, upon a sub-structure of stone. The window was a six-light one, of oak, divided into twelve lights by a transom, each light about seven inches wide by a little over two feet in height; the upper lights with Tudor arched heads, and the whole surrounded by a carved moulding consisting of a hollow, twisted ribbonwise, in alternation with two rows of beads. The proportions and details of this example of ancient Domestic work were admirable, but falling to pieces from decay, and apparently uncared for. The other specimen which caught our eye was a first-rate floriated wrought-iron hinge upon another cottage or barn door, the boards of which were dropping away from its friendly embrace. These solitary bits of old-world careful workmanship, in their evident state of neglect and decay, struck us by their melancholy air. They served to show that in Devonshire, like other places we have noted before, a spirit of art once flourished that now has utterly faded away. Nor were our musings of a much more lively character when we reached the charming old church, the contents of which tell a similar story of past devotion and present utter carelessness in matters of architecture. This church, like that of Berryarbor, consists of two parallel aisles, but has small transepts in addition, westward of the division of nave and chancel, which is unmarked save by the screenwork that is the principal boast of the structure. This screen stretches right across the church, and has nine and a half arches of four-light tracery in all. Five of these are between the nave and chancel, three-fourths of one is occupied by the respond of the structural arcade, and three arches and the half on the one side and the fourth on the other are between the nave aisle and chancel aisle. Each of these traceried bays has the lower part filled in solidly, and decorated with three arched panels, and the panels are painted with figures of the apostles and saints very rudely. The traceries are commonplace and coarse; the spandrels above the arches were once occupied by fan tracery projections on each side, and supporting the rood-loft, the doorway to which in the south transept is still visible. Unfortunately, fan traceries and all the superstructure have vanished, and are superseded by a poor cornice; part of the painted woodwork from this portion is turned upside down and used as backs of seats. A richer screen than this has been, and yet of second-rate character, divides the chancel aisle from the chancel. The whole has been once coloured, but coarsely, and some mouldings still show their barber's-pole-like ribbon ornaments in grayish-white, red, and green. The most interesting portion of this work is the treatment of the respond of the stone arcade, which occupies three-fourths of one of the arches of the screen; this is divided into two niches, with pedestals for the figures, and a buttress on either side of and between them. The canopy work has been gilt and painted with bands of black, with grayish-white ornaments; the buttresses have prettily-designed stencilled rosettes in gold on dark ground, and the pedestals, octagonal on plan, have the sides alternately green and red, richly diapered; the narrow spaces between the buttresses and pedestals are decorated with freely but coarsely-drawn flowing foliage in gray, with white flowers. The whole seems done upon some good traditional system, but by inferior hands, and the general effect of this screen arrangement is grandiose, but the detail poor. The tower of the church, 99ft. in height, is similar in character, but simpler than that of Berryarbor. The buttresses are not finished with pinnacles, and the battlements are plain; but octagonal pinnacles rise at each angle above the parapet, and are elegant in themselves, but do not appear to spring naturally from any feature below. In the lower stages

this tower is richer than that of Berryarbor, and is enriched with niches with statues in them. The Early English chancel has a well-proportioned trefoiled arched-headed doorway, and lancet windows. The position and surroundings of the church are exquisitely beautiful. A modern reredos at the east end is a sad eyesore. Some of the old carved seat-ends have been preserved.

Another interesting church in the neighbourhood of Ilfracombe in that of Morthoe, restored in 1858. This also has two parallel aisles and a south transept, and the junction of the transept and nave is curiously managed, the angle being carried on a slender column, and the wall bent outward so as to enclose a small additional space and provide room for two two-light windows arranged as a sort of projecting bay, and this space so gained is vaulted in a rude manner. In this transept or chapel is an interesting monument with a fine slab of limestone, raised on an altar tombstone, enriched with rude traceried panels; on the slab is a roughly-traced effigy of William de Tracey, Vicar of Morthoe in 1322, fully vested, and holding a chalice. The church is seated with richly-carved old oak seats. The building seems to have been well and simply restored, and the windows have Early and well-treated traceries. The position of the building is lofty, bold, and picturesque.

VIOLETT LE DUC'S "DICTIONNAIRE RAISONNE DE L'ARCHITECTURE FRANCAISE." *

X.

THE ingenuity of planning to suit this peculiar site and this dual purpose is very remarkable; how grand this pile of buildings looked in its palmier days is shown by two sketches taken by M. le Duc from the "Monasticon Gallicanum," and which we reproduce (Figs. 27 and 28). Now, alas, the glories of Mont S. Michael have departed. Not only are the small apartments L and K its prisons—all of it now serves this ignoble purpose; the tall flèche, with its upraised figure of the archangel patron, has long ago disappeared, and Time is achieving the conquest of this fortress, which successfully resisted many a siege, and withstood those foes Time has long ago driven into forgetfulness. Playing an important part in the wars of England and France, we have devoted a considerable portion of our space to this interesting building—at once a town, a castle, and an abbey; but it would require long study and much description to exhaust all the evidences of the ingenuity of those architects who built it; and we cannot point out a pleasanter summer holiday's study to those who will not think they get one unless they turn their backs on the architectural beauties of our own island than this interesting monument. We should like to follow M. le Duc through those other pleasant pages wherein he learnedly descants on the modifications effected in the buildings by the rules of the various orders; but the limits of our space, and the presence of so huge a fund of more useful matter, impels us onward, and we must turn to his sketch of the rise and progress of civil architecture in France.

Very few remains exist in France of civil buildings anterior to the thirteenth century. As we have already said, the new comers on the Gallic soil found ready to their hands the remains of Roman villas, and when they did build they used the old materials of these to produce something after their fashion. The baths, the theatres, and the palaces of ancient Roman work served for such public buildings as the weakened civilisation of those troublous times required, and when the struggle against the barbarians ceased, the struggles with almost equally savage feudal lords began.

* Dictionnaire Raisonné de l'Architecture Française du XI. au XVI. Siècle, par M. VIOLETT LE DUC, Architecte du Gouvernement, Inspecteur-Général des Edifices Diocésains. 10 vols.; 8vo.; Morel, Paris, 1864-1868.

Ecclesiastical and military architecture made more progress in those times than did that devoted to civil purposes. Town walls to protect the inhabitants, and town belfries to summon them together for mutual defence, were almost the only works constructed in the early days of France.

The communes of Flanders and Brabant, and some of those in the south of France, which preserved their franchise down to the sixteenth century, alone had leisure to erect municipal buildings. Many of these yet exist in Belgium, but during those fierce religious wars which devastated France in the sixteenth century, those which yet remained on her side were destroyed. One only yet remains, at S. Antoine, a little town belonging to the Counts of Toulouse, some few leagues north-west of Montauban.

During the eleventh, twelfth, thirteenth, and fourteenth centuries great numbers of hospitals were founded. The religious establishments were the first to offer an asylum for the sick and needy. Plague and pestilence were almost constant guests within the closely-walled, badly-drained, and unpaved towns of those days. The wars in the East introduced leprosy into the West, and many monasteries established in their vicinity small leper-houses and hospitals, to which the monks attended. Of these the Augustinian Order particularly devoted themselves to the service of the sick, and caused the erection of a great number of hospitals in the larger towns during the twelfth century. Private individuals followed their charitable example, and these buildings, respected by all the changers and changes of power, and resisting the overthrowing influence of revolution after revolution, almost alone exist, whilst other civil constructions have been swept away by the destructive tide of popular commotion. A hospital in those days was one long ward, covered with lofty vaulting, and divided into bays by means of columns. At one end was often a vestibule, and the other usually a chapel. Along one side ran the pharmacy, the cells of the monks or nuns who waited on the sick, their refectory and kitchen, often a cloister, and sometimes a church. On the other side was the garden, which played a great rôle then, when the "herbal" was the pharmacopœia and the herb-bed the druggist's store, and round all ran that feature common to all buildings then, a high surrounding wall—to be immured was to be safe. Nor were these buildings used only as hospitals for the sick; they served as the *hôtel Dieu*, and the poor, the houseless, and the wanderer found refuge there—a practice more charitable than wise, and tending much to spread those contagious diseases the records of which occupy so large a portion of Mediæval history.

As towns grew larger, and as the country became more secure for the industrious classes, market halls began to spring up, and Louis VI., a great fosterer of towns and their liberties, created several market halls in Paris. Beauvais, Pontoise, Lagni, Gonesse, and S. Denis soon followed the metropolitan example, and these edifices rapidly became a feature in most of the large towns; each trade had its own special "halle," and as these became gradually incorporated the one with another the word passed naturally into the plural and "les halles" and a market-place became synonymous. Bridges, quays, and sewers formed the other chief public works which occupied the attention of the early architects. Domestic architecture, of a private character up to the thirteenth century, naturally followed monastic traditions by the operation of the same law which imparted upon monastic architecture the earlier arrangement of the Roman villa: 1stly, because the religious establishments were then at the head of civilisation—they alone had preserved the relics of ancient civilisation, and had accommodated it to the manners of their time; and, 2ndly, because,

the monks were till that time the only persons skilled in architecture, sculpture, or painting. From these causes the conventual model was impressed on all other buildings; the palace had its cloister, or its open courtyard, surrounded by porticoes or arcades; the great hall took the place of the refectory; their large dormitories in common, held retainers and servants instead of monks, and only the "seigneur," who replaced the bishop or abbot, was provided with private apartments. Like the monastery, the palace had its hostelry for strangers and guests, and the large granaries and stores were common to both. Externally there was some difference. The everlasting walls were higher, were crowned with battlements and protected by towers, and the residence was as jealously guarded from the vulgar eye as though it belonged to a newly-made noble of the most advanced liberal politics. When, however, laymen were employed as architects at the beginning of the thirteenth century—(by the way, we must again explain we do not mean "lay man" in that queer nineteenth century non-sense employed by "Her Majesty's Commissioners for the '71 Exhibition," we mean by laymen, other than ecclesiastical persons, not other than professors of architecture. (Pardon the digression—we will sin no more.) When lay architects were thus employed a certain degree of rationalism in architecture followed as a natural consequence, and especially in domestic architecture. There was, however, a wide difference between the rationalism in art of the twelfth century and the falsely-called rationalism of this grand Victorian age. Then there was a severe rigidity of principle; plenty of liberty, but no licence; much originality, but no eccentricity; an intense hatred for vulgarity, and not many shams. These are the things which puzzle the archaeological architects of our day, who wish to copy a quaint form, yet never seek for that principle which induced the artist of the middle ages to adopt it. There were no absolute rules for the application of certain forms; there were, in fact, no rules beyond a rigorous observation of a principle, and within the limits of that principle free individuality was allowed, and that principle was to let every structural requirement be apparent. They did not in those days put granite columns as a mask to east iron up-rights, or turn a party-coloured stone arch in front of a cast iron lintel; the material was frankly confessed. If the house was of brick, of wood, or of stone, its form and detail was the result of the employment of these various materials. If they wanted wide or narrow windows they used them. If the interior was vaulted, the buttresses on the outside told you so. If wooden beams did duty for stone arches, the string courses which formed the bed which carried the beam at once confessed the fact. Where paniles were easy to obtain, the pitch was flat; and where flat tiles suited best the clay or small slates, were procurable the pitch was steep. Corbelled chimneys and raking windows to staircases came at the call of these men, who dared to build according to common sense, and people put them up now-a-days in inconvenient fashion because they look so pretty. In fact, they supplied a want in the most commonplace manner, and were not conceited. What a difference six hundred years have made! Lest it may be thought that we are too hard upon the British architect in these reflections, let us hear M. le Due in his reflections on our French confrères. "Certainly," says he, "we have in place of this brick houses which imitate stone; our wooden beams are carefully plastered up; our staircases cut their windows in two; and our windows are as big for little closets as they are for large rooms. Our chimney tops are ashamed to show themselves; plaster is painted to look like marble; and wood is painted to look like stone; and miserably poor construction is hidden under a luxurious envelope. To make your construction 'Gothic,' take some ornaments

stolen from some old palace, and throw a few handfuls into the elevation, and stick the windows full of mullions." M. le Due might have been poking fun at us, but it is rather consoling to know that the preacher himself has sinned, and if it were his works in rather than his works on architecture that we were reviewing we might exclaim "Et tu Brute." As it is, we don't; but enter upon M. le Due's admirable *résumé* of the causes which led to the decline of architecture in France—a *résumé* full of reflection and logical reasoning: "Feudal division," says he, "could not second measures of general utility. The feudal system was essentially a selfish one; under it that which a man did he did for himself and his, to the exclusion of the generality. Even the monastic establishments themselves were, to a certain extent, imbued with this exclusive spirit, for, as we have already said, they were feudal proprietors as lords of the manor. The mendicant orders were created with and by ideas diametrically opposed to the principles of feudalism, but becoming rich they forsook the principles of their foundation, and at the end of the thirteenth century had ceased to march onwards in the cause of the common welfare. It remained for political centralisation, for the unity of monarchical power, to create real public establishments, not merely for this or that little borough, or for this or that town, but for the country. We need not, therefore, be astonished to find before the sixteenth century an absence of those great buildings of public utility which rose so rapidly in the seventeenth, and which form the true glory of Louis XIV. The state of the country before this time did not permit the erection of public works conceived with grandeur, executed all at once and producing immense results. It needed the unity of monarchical power to enable a canal to be cut through two or three different provinces, each having its own customs, its own privileges, and its own prejudices; to organise for the whole country a system of barracks for soldiers, hospitals for the sick, bridges, embankment of rivers, and the defence of the land from the encroachment of the sea. But if the country gained prosperity and security from this unification of government, art lost. An official art is no longer an art; it is a formula, and art disappears when the responsibility of the artist is lost.

"The religious and monastic art of the nation was extinguished in the fifteenth century; civil architecture went out with feudalism, but shot forth a bright flame as it expired. The Renaissance, which did nothing for religious art but hasten its fall, brought to civil architecture a new element strong enough to renew its youth. Up to this time symmetry in the arrangement of plans was held in no esteem. Many causes had served to banish the observation of those rules which the ancients obeyed in the grouping of their buildings. The first type followed in the early dwellings of the feudal lords was that of the Roman villa which had housed their ancestors. Now the ancient villa was a country house, built without regard to symmetry. The second type was the castle, which had to follow the irregularity of its site, and seek for strength rather than symmetrical arrangement. A third cause also arose from the excessive narrowness and irregularity of the sites allotted to private habitations in towns cooped up by rigid, non-expansive walls. It was thus that those laws of symmetry, so ridiculously tyrannical in our day, never exercised their influence on the people of the Middle Ages, especially in those countries where the Roman traditions were effaced. But when at the commencement of the sixteenth century the study of antiquity and its monuments brought to light the plans of those Roman edifices in which the laws of symmetry were observed, feudal castles then seemed to be arranged pell mell—houses, palaces, public buildings, all designed hap-hazard, and appeared to the newly-tutored eye as the dwelling-places of barbarous savages. With

that mobility which is the characteristic of the French mind, it rushed into the opposite extreme, and gave a symmetrical arrangement to those buildings which, by the diversified nature of their requirements, did not allow of its use. Numbers of rich nobles had houses built marvellously symmetrical on paper, but marvellously uncomfortable to live in. The houses of the middle classes for a long time adhered to a disposition of parts suited to their requirements. These retained their common-sense until the seventeenth century, then they followed the prevailing fashion, and sacrificed their comfort to the vain laws of symmetry. Once on this downward way civil architecture lost all its originality. The elevation and the decorative features ruled the plan; it was no longer possible to say from its appearance what a building really was. Architecture, instead of being a judicious envelope for the various needs of a habitation, imposed its laws, or what are called its laws, upon internal arrangement, as if the first law of architecture was not that of absolute submission to requirement! As if it was something above and beyond human needs! As if the purely conventional forms which it had adopted could possibly have a meaning when they hindered what they were meant to aid. Nevertheless, the civil architecture of the Renaissance, especially at its birth and infancy—that is to say, from 1500 to 1550—almost always preserved that distinction between public and private buildings so frankly acknowledged during the Gothic period, and the civil architecture of France was superior to that adopted in Italy. The great architects of the sixteenth century, Philibert Delorme, Pierre Lescant, and Jean Bullant, followed with remarkable ingenuity the good old traditions of earlier days, whilst yet adapting the newly-found forms. If they employed the 'orders' of antiquity, or if they imitated Roman arts, they respected in their edifices the wants of their time, and submitted themselves to the exigencies of the climate they built in and the materials they were compelled to use. It was not until the time of Louis XIV. that civil architecture ceased to submit itself to true and natural laws, then only did it consider itself to be an abstract art, regulated only by conventional rules, unconnected with the manners and the habits of modern civilisation." No comment of ours could make M. le Due's deduction stronger. No words that we might add could make the lesson his words teach more pregnant with meaning—a lesson which we hope will be learnt by many, yet the warning has been given so often that we fear it will now be again unheeded. Our very walls are covered with a damnable handwriting, and none heed that as the architecture of the past fell when it became absurd, so will the architecture of this day of folly also fail. It is written "Mene, mene, tekel, upharsin!"

To the elucidation of those general principles which regulated the growth of military architecture in France, M. le Due devotes more than 120 pages. Indeed, this branch of Mediæval architecture has secured from him more study than any other modern writer has devoted to it. It, in fact, formed the nucleus of his larger work, being published as a separate treatise before his general dictionary was commenced, and from the early days of the Gauls down to the almost recent time of Vauban, we find the various changes which attack has brought to bear upon defence most ably chronicled. Even yet this early love clings to its author, and a criticism on the present fortifications of Paris and their influence on her late disastrous siege has recently appeared from his fruitful pen. Now, though this branch of study is not of active use to architects in our day, when the red tape of the State strangles all who are not of the Royal Engineers, and when, instead of seeking aid from the civic mind, the military constructor is induced to prey upon it, and is, by the State, thrust into

places which should be occupied by his betters, yet a knowledge of this important phase of the past history of the art of architecture will be a great gain to the purely civil architect. He will, by its acquisition, be led to look upon the ruins of those castles which yet dot our country as something more than picturesque "bits," valuable only for the sketch-book. He will be induced to study the expedients adopted by his brothers in the past, to seize upon the peculiarities of irregular sites, and will thus acquire many wrinkles in planning from the study of these buildings. He will be induced to take a greater interest in their preservation, foster in others a protective feeling for them, and may thus aid in forcing from a reluctant government, and such representatives as Mr. Ayrton, a recognition of the value of these and other historic monuments. Nay, more, he may even teach these unwilling learners that a well-educated architect is as important a man to the well-being of his country as a half-educated, loud-lunged politician. It is true that he may have to wait some time for this—changes in species, as Dr. Darwin demonstrates, are slow, and the development of reason in Members of Parliament cannot be expected just at present. In following M. le Duc through this bye-way of history, we shall use his light most when its rays fall upon that class of buildings which present a parallel in our country, and as the interests of the two countries were entwined so closely during the epoch which saw most of these buildings erected, we shall use that light frequently.

The Trajan column and the Commentaries of Cæsar supply our author, as they have many another, with illustrations of the wars of the Romans in Gaul; but into this division of his subject we need not follow him. The stockades of the Gauls and Belgii had no more influence on military architecture than had the wooden walls of later Saxon camps in England, or than the pahs of New Zealand aborigines have now. Possibly the only descendant of the wood-protected and wattled camps of early times nowadays doing duty is the "gabion," or bottomless basket, which, filled with earth or sand, forms the principal material of construction in our modern entrenched batteries, and this very gabion we find frequently represented on the Trajan column. The Roman camp, when seated in the open plain, preserved this regular rectangular prætorian form, so well known from repeated engraving; and it will suffice for the present to remark upon this that almost the only legacy it has left us is the word "quarters," as applied to the lodgings of soldiers; it, too, had little influence on architecture. But when fixed camps had to be constructed, the rigid rules of even Roman military engineering had to give way; the altitude, the area, and the defensive aspect of the site overruled all other considerations; individuality came into play, and that officialism which in all countries and in all times has strangled art gave way, and henceforth there was progress in consequence. How the walls of Gallo-Roman cities were constructed will be seen by the view of such a wall with its recurrent towers we extract from M. le Duc's work (Fig. 29). This illustration is taken from a restoration of a portion of the walls of Carcassonne, a place we shall frequently have to refer to, and respecting which the author of this dictionary has told us much, both in this work and in a small guide-book to its antiquities. Built of rubble stone, with bands of brick at regular intervals, this construction resembles many remains yet existing in our own country, and the illustration tells so well its own tale, as to how the embattled top of the tower was roofed over, how its windows were protected by mantlets, and its postern guarded by a stockade, that we need not enter into more lengthy explanations. Within an enciente of walls thus constructed, and usually placed on the highest part of the

area they circumscribed, was the citadel—the castle of later days. The idea thus fixed was one common to all early times, and was not modified until that great change in the art of attack which the invention and improvement in artillery necessitated in the means of defence. "From the sixth to the tenth century the defensive system of Roman fortification underwent but little modification; the means of attack became weaker instead of stronger during that barbarism which succeeded the fall of the Roman empire, and the few documents relative to the sieges of these times which have been handed down to us record a great want of ability on the part of the assailants. It is always difficult to hold together an irregular army, and if the threatened town could hold out long enough, it was almost certain to see its assailants disband themselves in order to pillage the neighbouring country." Little by little the science of attack became better studied, and a certain degree of method was introduced. Two lines of earthworks or palisades were established. That nearest to the walls of the threatened place was the line of *contravallation*; its purpose was to prevent sorties of the garrison, and shut them in from all communication with the outer world. The other line was that of *circumvallation*, extending beyond the besiegers' camp, and protecting them from those who might attempt to raise the siege. Opposite to the fixed towers, which dominated the walls, movable wooden towers were erected, raising their heads above the permanent ones, for height in those days meant even more than now a longer range for projectiles. These movable towers had the great advantage of being able to be brought against the weakest part of the defence, and where the garrison could only act in small bodies at a time. No doubt as the science of murder develops itself, and as all old devices crop up anew, we shall some of these next days see an iron turret, garnished with guns of enormous calibre, mounted on a traction engine, and the old movable tower reinvented. In those early days the "sappers and miners" were a very important corps, for at first the walls, unprovided with overhanging machicollations, covered those who were immediately under them so long as the attacking party could keep a discharge of missiles against the battlements. We, therefore, find great precautions taken in the selection of sites which could not be easily undermined. This care of selection is especially noticeable in the castles of Normandy and our own country, where the walls are so high and the site so well chosen that escalades or mines were almost impossible; but town walls could not always be thus happily situated or built so high, and there the miner had his way. When this work was commenced from the attacking party, the defenders tried to countermine, and burrowed after him, but these workers "i' th' earth" were wary men, and in time were sure to effect a breach. Meanwhile, the defenders prepared to receive them. The sound of the pick indicated the assailed quarter, even if the countermine had not interrupted the stealthy sapping of the wall's foundation. Behind this threatened point stockades were erected, and when the breach was practicable the attacking party found a very formidable obstacle before them, as you will see if you turn to Fig. 30, and behind this was frequently laid the foundation of a permanent wall, cutting off the damaged member, and frequently converting the space so inclosed into a regular man-trap for the assailants.

[The illustrations referred to in the foregoing letter-press were published in the BUILDING NEWS on the 4th instant; the letter-press referring to the illustrations given this week will appear next week.]

Owing to the heat, the imperfect drainage, and the crowded state of Aldershot, the sanitary condition of that camp is, it is said, unsatisfactory.

NOTES ON CARPENTRY, AND ON STRAINS IN STRUCTURES—IV.

ATTENTION may be called to some points of these details (see Figs. 8, 9, 10, 11, and 12); but we promised to make a remark upon an observation we made at the close of the last article, to the effect that it is necessary to respect each other's position, and it is this: that nothing begets a bad feeling between an architect or an engineer, and workmen, more than covering up bad work. It is next to impossible, unless the job be a very small one, for even the clerk of the works, and much less the architect or the engineer, to see that every mortice is cut to the exact dimensions and shape of the respective tenons; and it is unfortunate for both parties that some careless or dishonest workmen have at times covered up bad work; and, moreover, that some carpenters have not distinguished between those parts of a joint which are bearing surfaces and those which are merely for the purpose of keeping the several parts in their position, and this difference ought always to be kept in view; for bearing surfaces require the most perfect accuracy in fitting the pieces together, because it is necessary, in order to distribute the strains uniformly through the pieces, that the bearing joints should be equally close in every part; and when this has not been done, and the work has been covered up, the architect or the engineer often suffers for the fault of the carpenter.

FIG. 15.

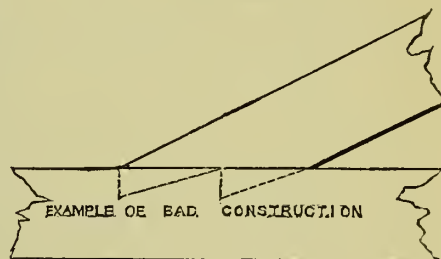


FIG. 16.

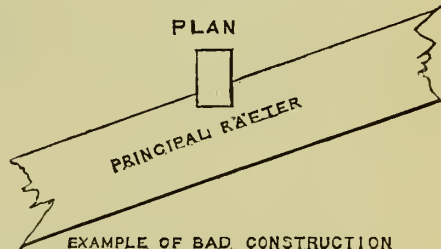


FIG. 17.

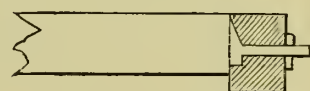
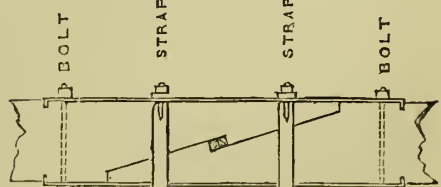


FIG. 18.



Now, looking at the foot of this principal rafter, we see that the bearing surfaces are thrown to the outside, where they can be seen, and this exposure to sight of all bearing surfaces is judicious, where the material is liable to decay—as, indeed, all materials are to some degree, and timber very much so—for then periodical inspections may detect the first signs of decay; but where

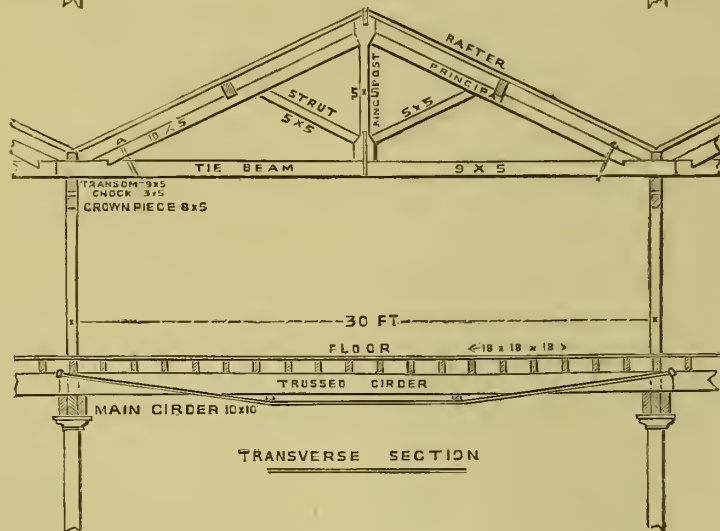
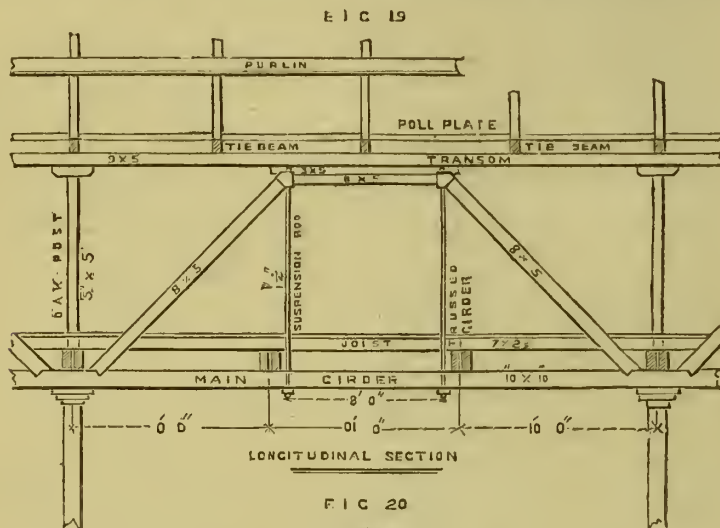
bearing surfaces are hidden, as in tenons (which ought never to be made bearing parts), the sudden failure of the structure may probably be the consequence. In one respect this may seem to be a small matter, but in making joints in carpentry the importance of small things is very liable to be overlooked.

However, to proceed with our subject, and referring to Fig. 8, the foot of the principal is boldly cut into the tie beam to a depth of about four inches, or one third of the whole depth, for about two-thirds of its width, leaving a portion in the centre uncut. This form is preferable to intricate tenoning, in which each part takes a separate bearing. One bearing in the direction of the length of the piece is better and more to be relied upon than two or more, providing the one is of sufficient bearing power to resist the thrust upon it, and if it is not so it is not strengthened, but weakened by being divided (Fig. 15).

the thrust of the strut, the tenon below retaining the foot of the queen post in its position laterally. The tie beam is supported against the strain of its own weight by being hung up to the queen post by the iron strap, the pressure produced by its weight being transferred to the head of the principal, through which and the collar beam it is ultimately transferred to the walls.

The purlin takes a square bearing on a shoulder cut in the principal to about one-third of its depth. The purlin is laid at right angles with the direction of the principal, and not vertically, as is sometimes seen in bad construction, because the direction of the pressure on the roof, whether it be its own weight, or the pressure of wind or snow, is at right angles to the direction of the principal rafters and therefore the purlin ought to be placed with its greatest depth in that direction to meet it (Fig. 16).

When, for want of head room, joists have



The foot of the principal is kept down by a strap. The object of the strap is simply to keep down the foot of the principal to its place, and not to resist the thrust, which is always provided against by the notch in the tie beam. The strap is therefore placed at right angles to the line of the principal, and a check-plate of cast iron is let into the underside of the tie beam to give a square bearing to the head of the strap.

The collar-beam has a solid bearing of 2in. for its whole width, on a shoulder cut into the queen post, and a tenon of 6in. by 2in. by 2in. to keep it in its place laterally. The head of the principal rafter has a similar tenon, and a shoulder-bearing of its full size, the queen post being cut away and sacrificed in order to attain this object.

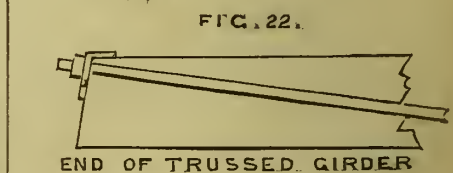
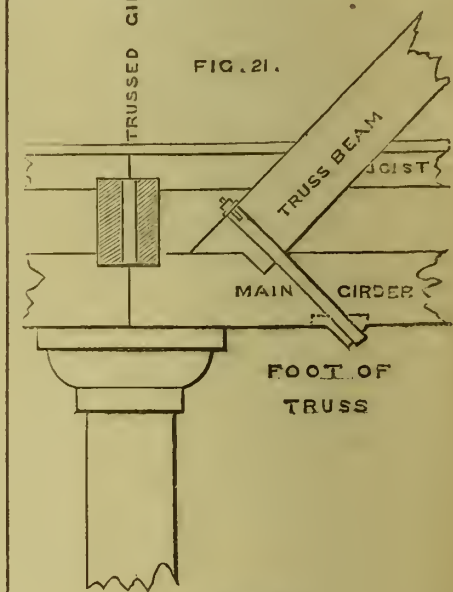
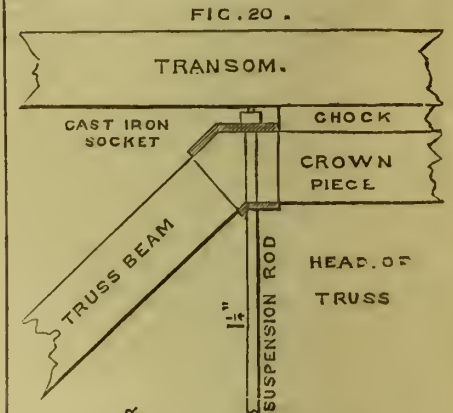
The foot of the queen post is boldly let into the tie beam to the depth of 2 in. on the side opposite to the pressure received from

to be framed into the sides of main beams, the mortices of the long tenons which keep them laterally in position must be cut at or about the neutral axis of the beam, at which part there is no strain, and this will be nearly in the middle of the depth. The shoulder which carries the weight being obliged to be, under the circumstances, in the lower portion of the girder, where the strain is great, must be no deeper than is sufficient to give a bearing, say $1\frac{1}{2}$ inch, as in Fig. 17.

When tie beams are so long that two pieces have to be joined together, a scarf may be made, as in Fig. 18.

A simple scarf of this kind is better than a complication of small cuttings and devices, the intentions of which may be good enough, but which, in practice, are defeated by the more inexorable requirements of strength in the main.

Figs. 19 and 20 show an example of a warehouse floor, executed, where the story posts stand 30ft. apart lengthwise and 30ft. crosswise, the main girders and the cross girders being each supported at two intermediate points by a truss. It will be seen how much stronger is the trussing of the main girders than of the cross girders, as, indeed, is of course proper, each main girder having to carry three times the weight of any cross girder; but the manner in which the main girders are trussed makes them much more than three times the strength of the cross girders, for the framed truss which supports the main girders at two intermediate points supports those points absolutely, and each third portion of the length of the main girders acts as an independent beam; but the trussing of the cross girders



is weak, and is not nearly equal in strength, but especially in stiffness, to one-third of the strength or stiffness of the main girders, which they ought to have been in order to make a harmonious whole. The angle that the truss rods of the cross girders makes with the direction in which the load acts—that is, the vertical—is too great to make a stiff floor, although it may be strong enough; and, indeed, the number of years during which it has been in use has proved that it is strong enough. Nevertheless, the inconvenience of vibration in a floor is a sufficient reason for close attention to the quality of stiffness. Otherwise, each individual bearing of the cross girder considered as a sepa-

rate beam is even stronger than that of the main girders, in the ratio of (instead of 1 to 3) 7 to 11, or nearly as 1 to $\frac{1}{2}$.

The details shown by Figs. 20, 21, and 22 do not call for much remark, except that, as will be seen, the cross girders are made up of two planks, 11in. \times 3in., with the tension rod ($\frac{1}{4}$ in. \times $\frac{1}{4}$ in.) between them, the head of each girder having a cast iron washer, which has a square bearing on the end of the girder. The main girder is 10in. \times 10in., made up of a centre piece 10in. \times 4in., and two outside pieces each 10in. \times 3in. These are combined into one beam by three straps, 7ft. 6in. apart. Sometimes a stronger beam may be built up in this way than by taking a whole balk of equal dimensions, for after timber is opened there is better chance of selecting pieces of the best quality. It has been a question, sometimes, whether converted timber, as it comes to us, is as strong as balk timber of the same kind, some saying that the inferior logs are cut up and the sound ones sent whole, others that it is not at every port from which timber is shipped that power and machinery exist for its conversion, and therefore that from those ports, whatever the quality of the timber that comes down to the port may be, it is shipped as log timber. The fact is, perhaps, that in this matter the trite saying that there is good and bad of all sorts may well be applied. Be that as it may, however, a beam may often be built up, by careful selection of sawn deals or planks, which shall be stronger than any whole balk of equal dimensions.

ANCIENT SERPENT WORSHIP IN SCOTLAND.

MR. PHENE has read a paper before the British Association at Edinburgh on "An Expedition for the special investigation of the Hebrides and West Highlands, in search for evidences of ancient Serpent Worship."

Referring to his statement made at the meeting of the British Association at Liverpool last year, he explained the grounds of his assertion that he had met with evidences of serpent worship in Britain. Entirely ignoring any tendency to former theories by Dr. Stukeley and Sir R. C. Hoare, the party of explorers sought new ground. The author referred to his own experiences in India in relation to this worship, traced its evidences in Egypt and other countries, its struggle in Greece with a more intellectual religion; and made a careful comparison between the minutely detailed accounts given by Messrs. Squier & Lapham of the alligator, lizard, and serpent mounds in Ohio, Wisconsin, and other parts of America, with certain mounds he had himself identified in Scotland as corresponding with these in almost every particular, some of which, as the "Beny Knowe," in Monteviot Park, he had opened, and in them discovered human remains. These mounds were in each case found in the vicinity of peaked mountains or hills, and accompanied, at greater or less distances, by megalithic structures and Druidical "pillar stones." That described as near Loch Etive, in Argyleshire, was so perfect in outline as to convey the idea of a huge and still animated saurian, the head being formed by a cairn, while large stones, as of an altar, were lying around. The dimensions were given as several hundred feet. He identified in the same way the Dragon Hill at Uffington Castle, Berkshire, and as delineations of animal forms, by the early British people, the White Horse, at the same place, and the rock representations at Ilkley; and pointed out how much the unscientific mind must have been impressed with the fossils of those enormous saurians, so abundant in Britain, and which must have seemed to the early residents as indicative of monsters of terrible power to propitiate which rites would have been instituted.

In the course of a discussion which ensued on both of Mr. Phene's papers, Dr. Ginsburg remarked that it was a very delusive thing, especially on the part of archaeologists and antiquarians, to go by semblances. Too often a semblance was mistaken for a reality.

Mr. BOYD DAWKINS observed that, so far as his experience went, there was an invariable relation between permeable rocks and hut circles, or early habitations. In regard to those early people, he might remark that they were a pastoral people, for he found the remains of the domestic animals which he had mentioned the other day in and around

their hut circles. Like our ancestors in the middle ages, they lived on hunting; but, unlike our ancestors in the middle ages, they had eaten animals which those ancestors would have been ashamed to eat—the fox, the wild cat, the horse, and all they could lay hold of. The last instance of what he might term rude, rough, and miscellaneous feeding in Britain, was that afforded by the monks of S. Alban's in the ninth century. In the ninth century, each canon's household was allowed, on certain feasting days, between Middlemass and Easter, by Harold, "either twelve larks, four magpies, two pheasants, or four partridges;" and this quotation was rather of interest, for it was the first mention of the pheasant at that time.

Dr. ARCHIBALD CAMPBELL had seen a good deal of serpent worship in India; and, on coming back to his native Highlands, he made a number of inquiries as to whether or not there were any serpents to be found cut upon stones, or any traces whatever of serpent worship there. He asked in every direction, and he found that none of the people of the Highlands could give any clue to traces of serpent worship. He had also been over the islands of Islay, Jura, Mull, Coll, and Tiree, and in those islands there were no traces, as far as he could find, of megalithic circles, or of serpent worship. The great depôt of megalithic stones seemed to be in North Uist.

Professor MACALISTER said that his experience, from long acquaintance with the Hebrides, exactly corroborated what Dr. Campbell had said. He knew of no serpent remains whatever there, or of anything which any unprejudiced person would take up at once as a serpent.

Dr. BROWN said that throughout Scotland there were indications of the worship of Baal, which seemed to have been connected with the worship of the sun. In most of the towns in Scotland, for instance, the boys' name for a bonfire was a "baal-fire." With regard to serpent worship, he could scarcely take any of the old sculptured stones of Scotland—those on which the cross was represented—without finding either the interstices between the arms of the cross, or ornamentation around it, made up of an ornamentation of serpents. Trace the ornamentation, and his friends would observe one or two serpents' heads, showing, apparently, the connection of serpents with religion, if they were not actually worshipped. He saw no indication in the stones that the serpents ever were worshipped; but their preservation on those ecclesiastical stones showed that they were connected with the previous worship of the people.

Dr. GRIERSON regarded Mr. Phene's second paper as an exceedingly good example of the class which took resemblances for facts. Any person, he held, could go into any mountain range in Scotland, or he supposed, in any part of the world, and if he wanted to see dragons or hobgoblins, he would see them. He did not think Mr. Phene had brought forward any evidence whatever to prove that there ever was serpent worship in Scotland.

Colonel LANE FOX remarked that Mr. Phene had undertaken his expedition in regard to serpent worship with a foregone conclusion; and the result had been that he had rather disproved his case than otherwise.

Mr. FLOWER observed that a very singular Troglodyte settlement was a short time since discovered, and had been described by Dr. Blackmore and Mr. G. P. Stevens. It consisted of a series or nest of caves excavated in the solid chalk and gravel. The contents were bone implements and flint flakes; a platform of calcined flints, probably used as a hearth, and a very singular kind of operculum or covering, formed of wattle and daub, the clay being from some distance. It was a remarkable circumstance, as connected with these dwelling-places, that they were almost always found in the most barren districts, as in Wilts, Durham, Northumberland, North Wales, and Anglesea. This seemed to indicate the pastoral habits of the people, or more probably their pursuit of the chase. The best lands did not seem to have been occupied, probably because the people had not learned how to cultivate the soil. Dr. O'Callaghan and Mr. Picton also took part in the discussion.

WARMING AND VENTILATION OF BUILDINGS.

A PAPER on a new system of warming and ventilation, prepared by Mr. J. D. Morrison, has been read by him before the British Association at Edinburgh. The main features of the system consist in so circulating fresh air through a warming chamber into the room, and foul air through the fire into the chimney, that all local currents are resolved into one, which forms an upper warmer current from the fire to the opposite wall, and an under colder

current from the wall back again to the fire, when, after supporting combustion, the products escape up the chimney. The vacuum thus produced by the warmer current through the chimney creates the now colder current from the atmosphere, which, passing through the heating chamber, supports the respiration of any number of persons. "I have," said the author, "built an addition to my house, so that one room, in particular, may be placed at the service of the medical profession, to test, by actual experiments on climate, the power of pure, fresh air, chemically-pure water, heat, light, and exercise on the human system. Through this room a general current of air passes and commingles; consisting of a purified and warmed current across the entire floor rising to meet a descending cooler and purified current from the entire ceiling; these having intermingled, support respiration, and then pass, by a ventilating shaft, to be burned in the fire. After thus supporting combustion the products pass into the chimney. Into this general current I can at will diffuse, by a branch circulation, a second current, which, having passed through a solution of any medicine, joins the main current, and is now inhaled as perfumes are from flowers. To give the British Association an opportunity of inspecting, on the spot, the mechanical arrangements by means of which I propose to carry out my views is the simple object of this paper."

THE PROPOSED NEW VEGETABLE AND FRUIT MARKET IN THE CITY.

ON Wednesday a numerous-attended meeting of the Markets Committee of the corporation of London was held at Guildhall, for the purpose of taking into consideration the proposed construction of a new market for the sale of vegetables, fruit, and flowers, in some central part of the City. Mr. J. F. Bontems presided. Mr. Deputy Walter, who introduced a very numerous deputation from the ward of Farringdon Without, who are deeply interested in the question, explained that the deputation was one appointed at a wardmote meeting, when the subject of the proposed removal of Covent-garden Market and the contemplated improvement of the market at Farringdon were taken into consideration. He strongly urged the importance of the question, not only to the members of the deputation, but to the whole of the inhabitants of the ward of Farringdon Without, and asked on their behalf to be furnished with some description of the plans which had been prepared under the direction of the City Architect for the improvement and enlargement of the existing market at Farringdon for the purposes named.—Mr. T. Rudkin, with the assistance of Mr. Andrew Murray, of the City Architect's office, then entered into a description of the proposed plan, which was exhibited on the table. The idea appears to be to excavate the present site of Farringdon Market, and to build, in fact, two markets, one above the other—one for the sale of vegetables, and the other for fruit and flowers. The entrance into the lower market, if the plan is carried out, will be from Stonecutter-street and Farringdon-street, and to the upper market from Shoe-lane only; but with access by means of stairs from Farringdon-street.—The chief object of the deputation appeared to be to ascertain whether the levels would allow of such a market as that proposed being of public benefit. In the course of the conversation which ensued several members of the deputation expressed themselves in favour of the plan proposed by the City Architect, whilst others were of opinion that the new market should be erected upon the vacant ground in Farringdon-road lying between the Holborn Viaduct and the Meat Market, the approaches to which, it was urged, were in all respects admirable.

After spending a couple of hours in inspecting the plans, the deputation withdrew, Mr. Deputy Walter warmly thanking the committee for the kind manner of their reception.

A HINT TO MORTGAGEES.—The position of mortgagees upon outlying properties is at the present moment anything but desirable. What with payment of ground-rent and loss of interest upon advance in the case of unlet property, the loss is continually increasing. If a house can be let at a rental simply to cover interest and ground-rent, it is desirable to let it at such a rate, or even lower for a time. In many instances small houses, which cannot be let to yearly tenants, can be occupied by weekly tenants of a respectable class, and thereby made to produce an income. Anything is better than total loss. With the filling up of a neighbourhood, and the gradual increase of trade, a better state of matters will eventually ensue.

HALF-TIMBERED HOUSES, ROCHESTER.

THE ravages of Time and "restorers" (1) attempts to arrest his assaults are rapidly tending to sweep away our few remaining half-timbered houses, examples of which are given in one of our illustrations. Such buildings are rarely "restored," although we might point to a prim phoenix or two which have started up, with garish timbers, brick patterns, and paint, but totally unlike the original time-stained, quaint, higgledy-piggledy dwellings of sixteenth century domestic architecture. To reproduce these is perhaps, after all, an anomaly, seeing that in the present day we must have air and light, and cannot tolerate the low apartment which belonged to, and was consequent on, the half-timbered, rough-cast fronts of ancient houses, to protect which from the weather our forefathers boldly projected story over story, juttied out the windows, and finally overhung the caves to shield the uppermost part of the building. The weight caused by the introduction of stone, brickwork, or tiles between the timbers allows but a feeble oversailing over the superincumbent story, with much loss of outline, shadow, and effect, whilst the projecting caves are useless, and serve but to darken the upper rooms. It is very amusing to note the reasons assigned by the *dilettanti* for this tumble-down manner of building, their general opinion being apparently that it was the effect of the quaint humour and arbitrary habit from building in narrow streets, not thinking of the numbers of isolated houses similarly constructed. Shakespeare might have looked at his own walls, so prettily "kept up," when he made Bottom say, "Some man or other must present Wall, and let him have some plaister, or some lome, or rough-cast about him to signify Wall." The ground-floor fronts of the houses which we illustrate have yielded to the bow window of the eighteenth century; but the upper stories are intact, and exhibit many happily-conceived details of ancient wood-work.

O. W. D.

THE PRESENT POSITION OF THE BUILDING TRADE.

THE owners of building land, says a writer in *Horne's Monthly Circular*, have lately been enjoying an enforced holiday. Now and then in select positions a plot or a few acres may fall under the hammer to a small or large speculator, but the sales are few and far between. In the suburbs of London, especially the western portion, a fitful energy may be observed, generally ending in unfinished carcasses, and the inevitable bill headed "In Bankruptcy." It is evident the trade has mistaken the class of house that is now wanted. Many incomes, which prior to 1866 might be counted at four figures in the pounds column per annum, have in many instances fallen away altogether, and in others dwindled to a third, or less, of a thousand a year. The natural consequence is that the rental, which can alone pay the percentage upon the outlay of large or medium-sized houses, cannot be obtained, from the fact that the income of tenants who desire such houses is too low to afford such extensive accommodation. Even in those localities wherein the usual ten-roomed house, after lying idle, has been added to by a fresh increase of building, the tendency has been simply to reduce the rental value of those premises which out of the mass are fortunate enough to be let. It is much to be desired that builders should turn their attention to a class of house suited for respectable individuals with from £80 or £100 per annum income. Such a house, containing six rooms, detached, would pay a good percentage upon the outlay, even at a low rent. Land can be obtained near rail direct to the City, where this movement can be carried out, and work provided for those who are now idle. The natural fall in the price of material for building has now reached a level at which alone judicious building operations will occasion the trade to revive. A curious domestic inconvenience has lately resulted from the present state of things. It is found a very difficult matter to get the dust removed quickly from the dwellings, owing to the want of some place wherein to shoot it when carted. When building was in full vigour, and estates were being plotted out, brickmakers were glad to buy the sifted cinders, and freeholders had no objection to purchase hard core at good prices. But now the once familiar board whereon appeared "Rubbish shot here" has been painted black, and gone into mourning over lost opportunities. If builders will build small houses at really cheap rents, there is plenty to pay them for their trouble; if not, the power of co-operation amongst those classes who desire cheap dwellings will very quickly abolish builder's profit.

NOTGROVE CHURCH.

THE chancel of this interesting little church is being restored by Mr. J. Edward K. Cutts, architect, of London, Mr. A. Groves, of Milton, being the builder. It is a structure of the latter part of the fourteenth century, lighted by two square-headed windows on the south side. There is no east window—an arrangement common to several churches in the neighbourhood—but outside, in the east wall, about 4ft. 9in. from the ground, a crucifix under a canopied arch, with pinnacles on each side, is carved in low relief. Under the chancel arch were two low walls, which formed part of the very small old Norman arch, the upper part of which had been taken out, probably at the time the present chancel was built, to insert a larger (but still small) arch, which was put in quite out of the centre of the nave and chancel. The whole wall was in such a ruinous condition, however, that it was found necessary to take it down, and in the rebuilding a larger arch has been inserted. The sanctus bellcot has been replaced on the new gable. There are monumental effigies of the Whittington family on the south side, and a female figure in the sacarium on the north side. The chief point of interest is the discovery of nearly the whole scheme of the original sculptured and coloured decoration of the chancel, which was as follows:—The south wall (with the exception of a small space between the window and the east wall, where portions of a flowing foliated pattern were found) was covered with masonry pattern of single lines, with a flower in the centre of each space; on the upper part of the east jamb of eastern window was painted a male figure. The same masonry pattern was found on the north side. In the middle of the wall a long niche was discovered walled up; on opening which it was found that all the work, namely—the buttresses, the pinnacles, and the mouldings of the label and finial over the cusped ogee head, had been chopped off flush with the wall; portions of these, which had been coloured, and the figure that stood in the niche, had been used to wall it up: all the jamb mouldings and the cusps of the head, together with the colour on them and on the back of the niche, still remain, the latter being Indian red, powdered with two patterns, one white, the other black. In the east wall the toothing of the masonry was left in such a manner as to show that the altar had been solid and built into the wall. Immediately over this, and stretching across the chancel, was a series of seven subjects, painted in fine red lines, with the exception of some of the nimbi, which were dark, and the hair yellow, and divided by a broad line of vermillion with a dark red line on each side; the only decipherable groups are the Crucifixion in the centre compartment, and S. Mary Magdalene washing the feet of Christ, on the extreme left. Above this were two niches, one next the north wall and one next the south, of the same kind and destroyed in the same way as that in the north wall; the one on the left had the mouldings, &c., painted, and on the back at the top is a hand issuing from clouds towards the right; on the left is the outline of the figure of an angel in red; in the centre are the remains of leaves, and on the right are traces of another figure; the space between is powdered over with a flower; there is no doubt that figures representing the Annunciation stood in it. On the back of the niche on the south side is a brightly-gilt star, with a hand pointing to it, and the rest of the ground is covered with an elegant flowing pattern in white on a dark green ground; this, no doubt, contained figures of either the Nativity or the Epiphany; it is a foot wider than the other niche. Between these were sculptured two seated figures, which stood out from the face of the wall on a projecting base of some kind. Over them was a projecting canopy, in three groined compartments on the underside, finished with a finial at the top; this has all been chopped off nearly flush with the wall. The figures are thought to represent the enthronement of the Virgin. Higher up, and between the finials of the niches and centre subject, were painted in bold red outlines, with dark nimbi and yellow hair, the figures of six saints seated under trefoil-headed compartments, with quatre-foils between the trefoil heads, finished over all at the level of the wall plates with battlements painted in rough perspective; there are no traces of colour above this. Some other minor discoveries of interest were a square opening under the westernmost window in the south wall, which had evidently been fitted with a shutter; two coins, one of William Rufus, were pulled out with the piscina; another of Edward I. was found in the soil at the foundation of the south wall, and some wood (?) charcoal was found in a rough cavity in the well into which the piscina discharged. The restoration comprises the rebuilding of the south wall, a new roof, seats and desk in stained deal;

new communion table, railing and lectern in oak; new tile paving (Godwin's), stained glass, and a wrought iron corona of twelve lights.

ART EDUCATION IN MANCHESTER.

IT does not appear from the last annual report of the Manchester Society of Architects that art education is making much progress in Manchester. The report, which is signed A. W. Mills, President, and J. Murgatroyd, Hon. Sec., says: "First, then, the question of the education of the pupils and assistants in the offices of members of the profession in this city has engaged the attention of your council. They found that an attempt had been made within the last few years by a kindred society to establish classes for the study of drawing, mathematics, and other matters appertaining to the technical education of the architectural student; that the project had failed, not from any want of exertion on the part of its promoters, but by reason of the unwillingness on the part of the students to go through the labour necessary to the acquisition of this particular kind of information; that, in fact, though the opportunity was offered, there was so much lukewarmness on the part of those whom it was calculated to benefit as to discourage the promoters."

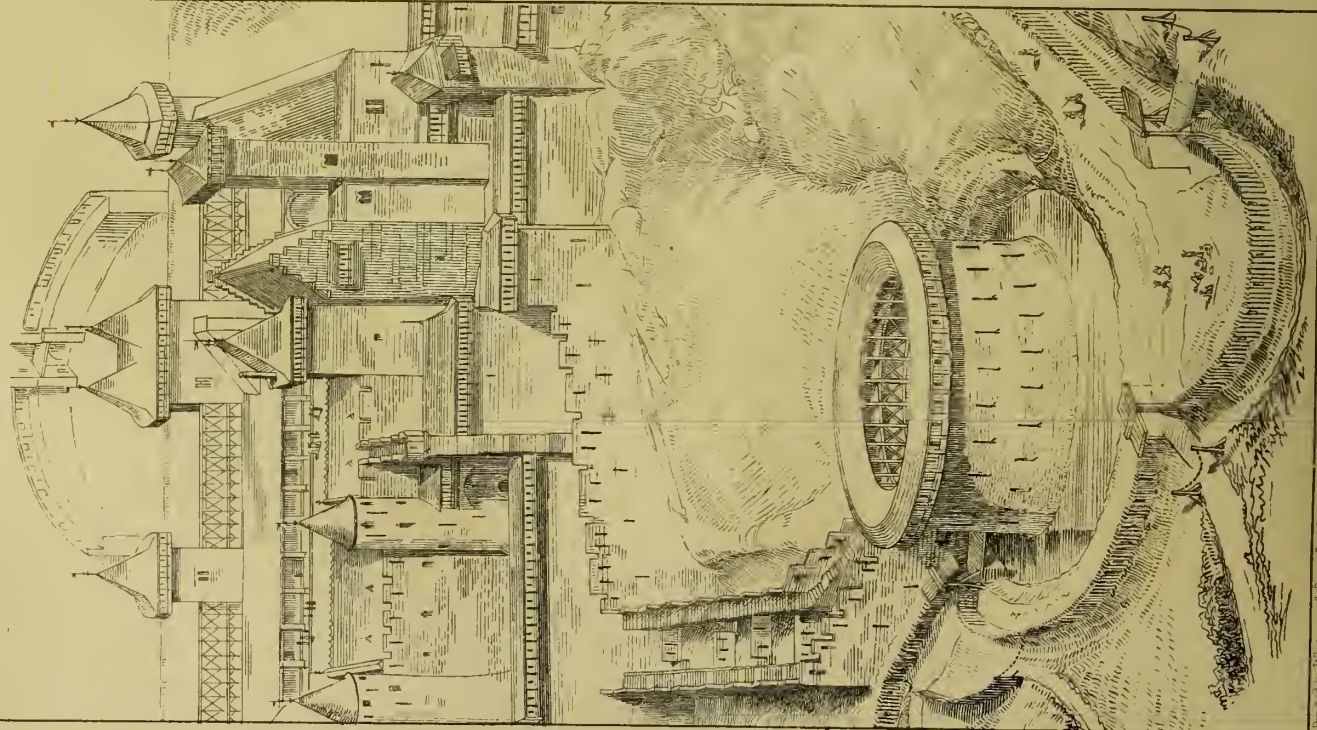
A little further on the report says:—"Another point that has engaged the attention of the society has been the technical education of the workmen. Finding that the workmen of the building trades had established a night school under the name of 'The Building Trades Technical Education Institute,' several members of this society consented to be placed on its board of management. The classes meet on two evenings in the week, for the purpose of learning drawing likely to be useful to them, and studying geometry, arithmetic, &c. Mr. Isaac Holden and Mr. Corson have successively occupied the post of president, and those gentlemen as well as your honorary secretary, have from time to time delivered lectures and addresses with the view of advancing the objects of the Institute. It is found that here we have a peculiar material to deal with, and the great difficulty is to rouse the *thinking* faculties of the members. Prizes have been offered by this society, and also by other gentlemen taking an interest in the Institute, but it is found that those problems requiring for their solution clear, independent *thought* are apparently the least charming to the competitors. It is proposed to set out for them, therefore, a more strictly direct and practical course of study than that which they have hitherto pursued, and your council hopes that gradually one section at least of the working classes may be disabused of the idea that one man is as good as another, or that full pecuniary results should follow on mere muscular, unaccompanied by intellectual, exertion."

A DECORATED BIBLE.

ON Monday last an elaborately-covered Bible was presented to the Princess Louise by a deputation from the Church of England Sunday Schools. The binding of the book was an unusual specimen of the bookbinder's and silversmith's arts. The sides are of vellum, diapered in gold, with tooling of appropriate devices, and enclosed in a mounting of silver, perforated with foliage set with jewels, and enriched with scroll wire work, having gems for the flowers. The sides are strengthened with applied mouldings, and united to the back by continuous silver hinges. The back is also of silver gilt, moulded into a very elegant form, with plates at top and bottom to protect and conceal the actual sewing of the printed sheets, and is adorned in *repoussé* work with the sacred monogram, the title and date in ornamental characters, with foliage and jewels in appropriate settings, and in the lower part with niches beaten in the silver containing the Princess's initials, entwined with her coronet and the ancient ship which is borne on the shield of the Dukes of Argyll for the lordship of Lorne. The composition is united and completed by tabernacle work mouldings and foliage. The whole is of Mediaeval character, beaten by hand out of silver plates, and is a fair example of the skill and thought that can be expended on works of such moderate dimensions, and that are required to make them works of art. The work was designed by Mr. S. J. Nicholl, architect, and executed by Messrs. Cox & Sons, of Southampton-street, Strand. We have seen a photographic illustration of the Bible as presented, and, though it is covered with coronets and symbols of nobility, we could not see a trace of the Christian symbol—the cross—anywhere.

DETAILS, FROM VIOLET-LE-DUC, 'DICTIONNAIRE RAISONNÉ L'ARCHITECTURE.'

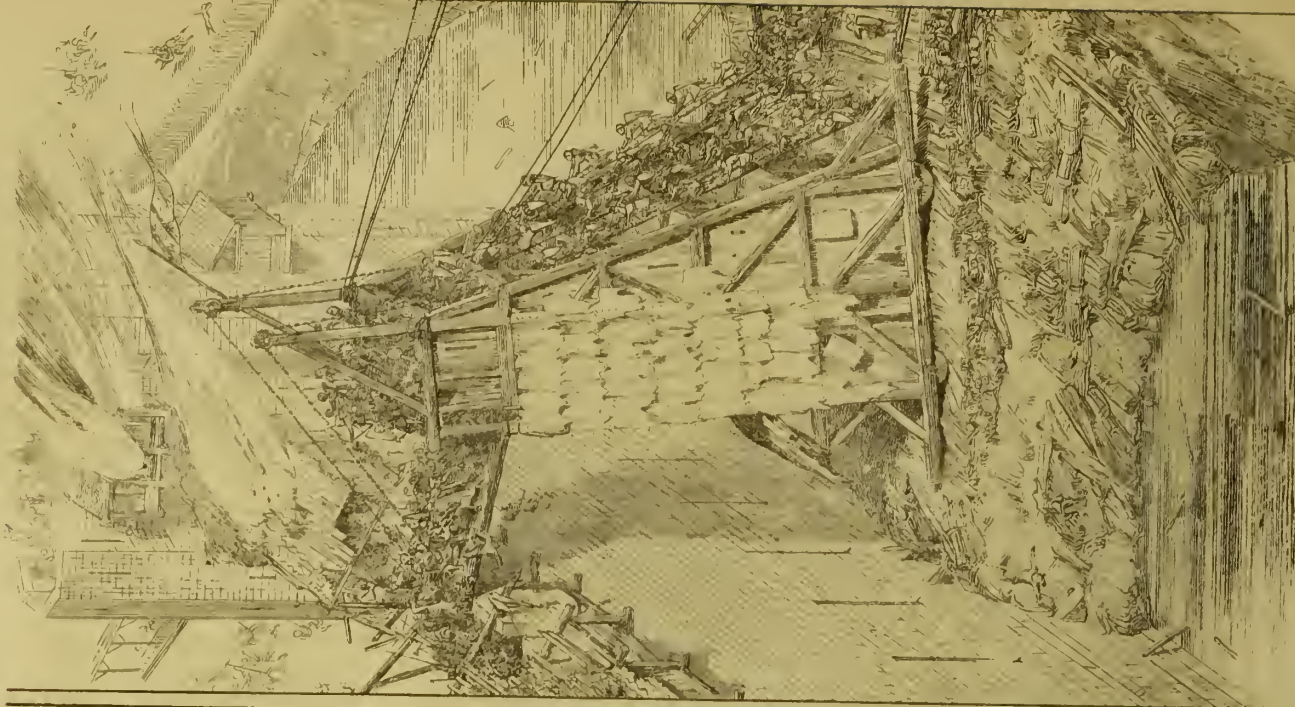
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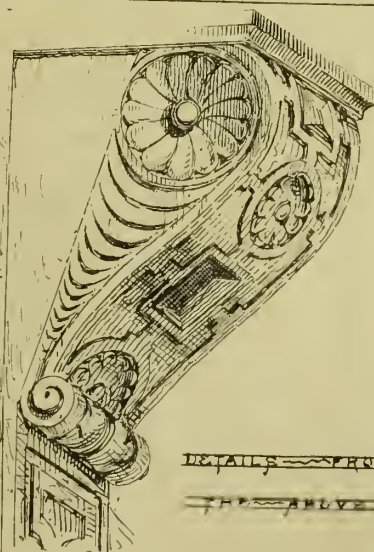


33.





HALF-TIMBERED HOUSES—HIGH STREET ROCHESTER. DRAWN BY OWEN W. DAVIS



DETAILS FROM
THE ABOVE

REPORT ON FURNITURE AND METAL WORK IN THE INTERNATIONAL EXHIBITION OF 1871.*

FURNITURE does not form a distinct class in the Exhibition of this year; our report, therefore, deals only with a few objects sent as examples of design, workmanship, new material, or new invention, and it will be seen that though these objects are comparatively few in number, the novelties, both in design and workmanship, are numerous.

The leading firms of makers of sumptuous furniture are exhibitors in the British Galleries, and the visitor will find examples of the most costly production and the best workmanship that Europe can produce. Messrs. Gillow, Holland, Jackson & Graham, and Trollope are amongst the best known of our great English producers (we name them in alphabetical order); whilst Messrs. Foundinois, well known as competitors and medallists at our great international exhibitions of former years, are expected to represent the design and the workmanship of France, so renowned in Europe and America.

It cannot but interest any observer of the tests which these exhibitions afford us of the changes of fashion or taste, to see how great the differences are in this matter of domestic furniture since the first great gathering in London in 1851. Our own makers in England have derived not a little advantage from those competitive displays, as a glance round the galleries in 1871 will show. The excellent cabinet work which maintained the reputation of Chippendale, his father and son, Sheraton, Lock, and a number of names well known in the latter part of the last century, was made no longer. The good "English Louis XVI." design, for which we were much indebted to the Brothers Adams, architects of the Adelphi Buildings, Portland-place, and many private houses, had disappeared twenty years previously. The wars at the beginning of the present century, and the social and economical consequences they entailed, seem to have made a clean sweep of the artistic designing and working power of the country as regards this class of productions. Though decorations, furniture, and art in all forms of this industrial kind began anew under the Regency and the two subsequent reigns, the result in point of taste was small. In the special Report on Design ordered to be prepared by the Commissioners of the Exhibition of 1851, vagueness and want of propriety in adapting suitable designs to the several objects made is a constant complaint, whether reviewing the actual furniture and utensils or the designs applied to carpets, hangings, and other decorations. No such strictures could be applied to these productions in 1871.

The effect of the good designs and careful workmanship, the former more particularly, of France, Italy, and other foreign competing nations, must be credited with much of the improvement we now see. We must not forget another still more powerful influence, the research made both in England and on the Continent into the good design of furniture-makers of the sixteenth and following centuries. This country has been provided with excellent examples of the best period. While Mr. Pugin did much to revive the value of the good constructive principles and fine designs of the Mediæval wood and metal work, the art of the Renaissance centuries has exercised, since his time, a still more powerful attraction. In this Exhibition we see Classic furniture, one fine specimen of the designs of the Mediæval period, several Renaissance designs, some wood constructions from various parts of India and from Japan—all most characteristic of their several methods of decoration; and a number of pieces of furniture, highly decorative and completely modern, for the bedroom, as well as the receiving rooms of the house. To put more completely before the reader the distinctions of style more or less exemplified in the pieces contributed, we may notice summarily the changes which household furniture has undergone.

The furniture of the Classic period is illustrated for us by some interesting objects contained in the central tower of the Foreign Picture Gallery. These consist of electrotype casts of old bronze furniture discovered in Pompeii. There are a bed or couch, two seats, a table, &c. These will be more fully described in the Report on Reproductions. A word, however, must be said of them as specimens of Classic furniture. The couch is such a bed as we recognise in the careful painting of Alma Tadema, the Belgian artist. It is, in form, like our modern sofa. The ancients furnished these with mattresses, outer and inner, or over and under, and when sleeping, used on them woollen rugs, carpets, or counterpanes, according to the term we

like to give to a covering hairy on one side, splendidly wrought in colours in the loom, and such as the "exquisite" of Imperial Rome would have paid a full price for as the production of Corinth. The material of the bed is bronze, with indications of inlaying in silver. The visitor will note how entirely the form is one borrowed from wood. The original either contained a core of wood, or was moulded from a model turned in the lathe. The seats are a "sella" and a "bisella," or "bisellium," a single and a double seat. Quaint heads of men, horses, mules, &c., are seen in the volutes below the seat, acting as connections between the seat-frame and the upper bar.

The height of the seats was an attribute of personal dignity. Rich patricians, or freedmen, farmers of the revenue, &c., had these chairs carried before them to theatres, to the law-courts, and other places of public resort, so as to sit "higher" than their poorer neighbours, and see over their heads. Another point of etiquette implied in the height was the use of a "scabellum," or footstool. These seats are also of bronze, inlaid, and following the lines of a wooden construction. There is also a bronze table frame, with the supports or legs connected by diagonal bars, shifting up and down in slots at the back, so as to be folded and carried away. To such a table, a marble or wooden slab or top would be fitted.

We pass from these relics of the past to the Mediæval period, represented in the Exhibition by a pair of doors made for Costessy Hall. These are in the style of the fifteenth century, and are arranged and framed up like widow tracery. The panels are cusped, and are filled in with shields of the families of Jerningham, Howard, Gerard, &c. The carver of these doors is Mr. Britcher. The whole are after the designs of the late Mr. Buckler.

In the next great change in the forms and construction of furniture, we find something like architectural structures, with pediments, columns, arches, and all the minute subdivisions of the cornices or coronas that finished the top lines of Classical architecture. This new style came into fashion in the late fifteenth and early sixteenth centuries. It followed the changes of architecture and sculpture. The Italians speak of the style as *quattro cento*, —i.e., earlier than 1500—and as *cinque cento*, when later than that period. It is known under the general name of Renaissance, as Classical learning was revived and taken up with great energy towards the end of the fifteenth century. Many powerful causes contributed to bring about the changes in architecture and art generally which then took place. One of the most effectual was the taking of Constantinople by the Turks. This drove what remained of Greek art and the old refinement of a former age into Italy. While these influences were brought to bear on Italian art, great men, the greatest artists that have been produced in modern or post Classic times, rose up; painters, sculptors, architects. Their names are familiar to everybody. It is only necessary here to point out that these artists or their pupils were not above devoting their talents to every form and variety of art. Michael Angelo, Leonardo da Vinci, Sangallo, Cellini, designed and made goldsmiths' work and jewellery, as well as canals, fortifications, wells, reservoirs, and other engineering operations, without ceasing to paint pictures and sculpture statues. The grand dukes and great noblemen of Florence and Rome employed them in executing costly cabinets, tables, and room furniture. They painted and carved chests and caskets, many of which remain models of excellence to this day. Every form and variety of costly furniture of that day may be seen in the South Kensington Museum.

It is in this style that we shall find the most costly pieces of furniture in this year's Exhibition. Some of these reproduce, but not in any way as direct copies, the characteristics of the earlier or *quattro cento* period; others the fully-developed splendours of the Renaissance, or *cinque cento* style, when it had become the reigning type of art in all forms, furniture not excepted, all over Europe.

Thus, in the British Gallery, we recognise a side-board of the Messrs. Gillow, which is exhibited in connection with a panelled wall, much of the feeling of the earlier period. The wall panelling which accompanies the sideboard is a sample of the woodwork with which Messrs. Gillow propose to fit the room for which it is made. No plan can be suggested more judicious than this for giving the full expression to the designer's intentions. Our neighbours in Paris have, in all exhibitions, well understood the value of "backing," or seconding the furniture they exhibit by a small enclosure or background, to show how they propose to adapt the

rooms of the house and the furniture to each other. Where there is room for such an addition, it both sets off the particular object, and adds to the effectiveness of the whole hall or gallery.

In the instance of the sideboard of Messrs. Gillow, and its corresponding woodwork, the delicate lines of moulding, small subdivisions of panels, careful insertion of carved work, partly after nature, but still with a suitable reserve of conventional treatment, and the border or fringe of little rails, turned in the lathe, with fine lines and neckings, carry us back to the effective use of such forms and divisions as characterise the early Renaissance work in our museums. Paintings, also, are proposed to be structurally united with the woodwork. Suggestions of family portraits are let into the wall-panels so as to bring the painter and gilder into co-operation with the joiner and the architect. Other pieces are exhibited by the same firm, which exemplify the characteristics of this interesting period, the early dawn of the Renaissance arts, e.g., a cabinet of ebony or ebonised wood, inlaid with small panels of pear and amboyna wood, both of a soft light brown. These materials are lightly and elegantly intermixed, so as to reticulate the black agreeably with the lighter colour. The metal work, handles, lock-plates, &c., are made in copper instead of iron, or any white or even gilt metal, the more completely to preserve this harmony of tone.

A cabinet, in two stages, exhibited by Messrs. Collinson & Lock (No. 3053), is conceived in the delicate lines and divisions of this Early style. It is full of ingenious little drawers, shelves, and receptacles, reminding us, in this respect, of the quaint devices of Japanese cabinet-makers. The central portion of the upper and lower stages is shut in by doors. These are panelled, and the panels occupied by Classical figures, painted in white or vermillion, and with birds, all admirably drawn. The dark wood (mahogany stained black) is covered with arabesque painted ornament, and the supports at the angles are turned in the lathe. These have delicate strings and neckings, but no violent lumps or protuberances.

The difference between the furniture of the fifteenth and that of the sixteenth centuries is the same as that between the architecture and the painting and sculpture of the same period. The one was in a transition state, and retained much of the tender feeling of earlier associations. The other launched into the Classical spirit completely. The earlier was delicate and refined, the later skilful and bold. The earlier style was without the breadth and largeness of treatment that distinguished the later.

Amongst the features still more characteristic of this later than of the former period, we notice the architectural character thoroughly pronounced. As to this period the great artists mostly belonged, so the productions in the form of furniture, which reflected their designs, have maintained the longest and the widest popularity. Amongst the leading objects in the Exhibition illustrative of complete Renaissance design, we shall not fail to notice the costly cabinets, in ebony and marquetry, of Messrs. Jackson & Graham (Nos. 3066, 3068); and in ebony, carved and inlaid with painted metal plates, shown by Messrs. Trollope & Sons (No. 3088).

The first-mentioned is a cabinet of sixteenth century design, in two stages. Each stage has doors and narrow drawers below the receptacles they enclose. It is a model of workmanship. As we open and shut the doors they seem almost air-tight, as the fine surfaces of the doors and frames fit into each other as though oiled. The panels are inlaid with engraved ivory, lapis-lazuli, &c. There are on the work no figure designs. It finishes with a pedimental top. The design is by Mr. Alfred Lornier.

In the inlay and veneering shown in these sumptuous cabinets, it should be observed that stone and various woods are employed together, and that the utmost skill has to be shown in the juxtaposition of materials, and in preparing and seasoning the wood so that it shall not shrink from the stone it holds. All wood is liable to lose in bulk as the juices of the tree dry up; and some, such as oak, takes so long before this process is complete, that years—in the case of oak in large beams, even centuries—are often insufficient to dry the heart of the wood absolutely and completely. In forming a judgment of the care and experience necessary for complicated pieces of work highly decorated, all these elements should be weighed.

The two ebony cabinets exhibited by Messrs. Trollope are decorated with carving and inlaid with plates painted in gray after the gray Limoges enamels of the sixteenth century. These grays are kept very grave and low in tone. The carving of the foliage in both these cabinets has been noticed already in the reports of the jurors and others em-

* By J. HUNGERFORD POLLEN, Esq., M.A. From the Official Reports. Printed and published by J.M. Johnson & Sons, 3, Castle-street, Holborn.

ployed on that class of objects in the Paris Exhibition of 1867. This part of the work is from the chisel of Mr. Rogers.

The French cabinet-makers have preceded our own in the manufacture of modern ebony cabinets. M. Henri Fourdinois, the maker of an elaborate cabinet, for which a gold medal was given in the Paris Exhibition,* is the principal exhibitor of costly furniture amongst the foreign contributors. He has produced inlaid work, which is not merely a thin mosaic of slices of wood, ivory, &c., cut to fit each other and glued to a solid base. He has regularly married his woods together, fitting thicknesses of two or more woods one into each other. This is a solid inlaying, far beyond the slight thickness of veneers, and is a massive method of working worthy of Classic authorship. Besides the inlaid work of his cabinets, M. Fourdinois employs the resources of wood sculpture, and the figures that decorate or support his furniture of this kind should be taken as samples of the excellence of the French artist-workmen.

A fine walnut-wood cabinet, by Fourdinois, is placed in the French Annex. It is in two divisions, supported on Sphinx figures, with circular pedimental tops to the upper portion, over which are carved recumbent figures in the attitudes of Michael Angelo's "Night and Morning." The limbs of the Sphinx-supports suggest life and motion, perhaps to excess. M. Lama, an Italian maker, exhibits a small, elegantly-decorated cabinet, in ebony and ivory.

During the Renaissance centuries inlaying and veneering came into prominent use, first in Italy, and more gradually in the north of Europe. Inlaying is the insertion of precious woods, ivory, pebbles, lapis, or other hard stones, into the wood that forms the base of the surface decorated. The process is not modern, as it was known and practised in Classical times. The Egyptians and the Ninevites inlaid their chairs and tables, their arms and chariots, with ebony and other hard woods, with ivory, and even silver and gold. Pieces of fine carved ivory, gilt in places, that have been inlaid in wood, but have outlasted it, can be seen now in the Nineveh Gallery of the British Museum. These are amongst the treasures found by Mr. A. H. Layard. Everyone has heard of the chryselephantine, or ivory and gilt statue of Minerva at Athens; this was an instance of both inlaying and the further process named—veneering—the base having been wood. Veneering was in general use in ancient Rome, both in architecture with thin slabs of marble, and in furniture on wood. Slices, or veneers, were cut from root wood, and from the lumps or heads of pollard wood. These produced the "birdseye," or rippled and wavy grain twisted into every imaginable curve which is now in use for similar purposes. Ebony is worked in this way. The wood "*diospyrus ebenum*" is found of various colours: black or brownish, yellow and green, but the black is the most valuable; we probably owe its introduction into modern Europe to the Dutch discoverers and colonists who occupied Ceylon about 1695. No less than 800 tons of black ebony altogether are imported from Ceylon in a year. Ebony is found in small dimensions only. No planks of any width can be cut from it, nor would the material, though close and hard, be suitable for the constructive requirements of joinery. It is generally veneered on mahogany. The under surface of the veneer or slice, and the upper surface of the solid wood base, are slightly roughed or rasped, so as to insure a sufficient openness of fibres. They are then covered with glue in a boiling state, and pressure is used to bring the two surfaces into the most complete contact. If anything like a bubble of air is detected between the surfaces this is pressed or knocked out with gentle blows of a flat-headed hammer. Screw presses then hold the two firmly together till the glue is thoroughly dried. When this is done by experienced workmen the woods will often split or break away in any other part of their thickness before this connection gives way. Ebony cabinets are always veneered. We have, however, a sideboard of ebony made in Ceylon, great portions of which are cut out of solid wood.

Factories for inlaid work in marbles, pebbles, carnelian, and other hard stones, have been long established at Florence. We call attention to two tables by Bazzanti, in the Italian Picture Gallery. The inlay aims at too close an imitation of nature, but it is very skillfully put together.

During the costly and splendid age of modern furniture, all the artists of Europe followed those of Italy. Francis I. introduced Primaticcio and Benvenuto Cellini into France: and, in consequence of the schools of artists and workmen then established,

all sorts of costly works were made in every kind of material.

Partly illustrative of the great school of Italian sixteenth century furniture-artists, we must point out a large buffet of walnut, made, we believe, wholly at the National Art Schools of South Kensington, or under the guidance of their teachers and students. This is a broad architectonic structure in the form of a chest, on legs or supports, and divided into three front panels, the central being the widest. These are filled with porcelain, painted (after a drawing by Mr. Marks) by the female students at South Kensington. The subject represented is a May-day Procession, and the figures are dressed in Swiss or German costume of the sixteenth century, Holbein's period. The top finishes with a broad fascia band of carved leafwork, and a regular architectural corona. The design of the entire structure is by Mr. F. Moody. The carving is simple but effective, and the whole has been produced at a moderate cost.

Another characteristic sixteenth-century piece of furniture, also designed by Mr. Moody, is a screen frame in the bold monumental style of the mortuary tablets, door-frames, &c., of the Italian architects of Rome and Florence, rather than the contemporary decorative ornament of Sansovino, and other north Italian architect sculptors. It finishes with the broken pediment, suggestive of a central bust, so commonly found in fire-place panels of its period. The cutting is bold and very simple, and the gilding placed on edges, or in occasional hollows. *Parcel gilding*, as this is called, or partial application of such enrichment, is effective, without detracting from the value of the walnut-wood of which the frame is made.

Heavy carved oak furniture belongs, with us, to the Tudor and Stuart times, as it does to the contemporaneous reigns in France. Splendid works were turned out, in walnut, by Berrugete; then by Alonzo Cano, and others in Spain. In Germany, we know there is a famous chest or cabinet, preserved in the public museum at Berlin, made in Pomerania, and decorated in all sorts of precious materials. A multitude of artists were employed upon it, whose names are recorded. In general, however, till marquetry came regularly into fashion, oak and pine were the materials used in Germany. The bold seventeenth century work is represented in the present Exhibition by Messrs. Snyers-Ilang, of Brussels, and such work will be seen in the Belgian division of the picture galleries and in the lower corridor. Belgium makes and imports to this country great quantities of oak furniture, in the quaint heavy style of the Flemish seventeenth century. The Swiss makers send similar work contributed by the Messrs. Wirth.

The next great period or character in modern furniture must be called that of marquetry. This is a variegated, more or less, pictorial surface, formed by very fine veneers. These thin slices of wood form a mosaic of many colours.

The early use of this decoration has been called *intarsiatura*, and it was simple and grave enough for the ornamentation of church benches and stalls. The later and lighter style was called *marquetry*, and seems to have been carried both farther in variety, and to greater splendour and completeness in France, though it continued to be made also in Italy, Germany, Belgium, Spain, not to say in our own country. We meet with wood inlay in old English chest panels, bed panels, &c., as early as the period of Elizabeth; but where it is actual English workmanship, the inlaying is rude and simple. In the finer specimens of the great French cabinet makers, who were famous for work of this kind from the days of Louis XV. to the destruction of the monarchy, they represent floral or conventional designs. In the earlier furniture, such as cabinet fronts of the seventeenth century, figure subjects, often drawn with the utmost spirit and humour, were displayed. Hunting scenes, love making, landscapes, &c., were literally painted in coloured wood-work. The Spaniards, the French, and the Italians were pre-eminent in these spirited productions. Examples may be seen in the South Kensington Museum.

A certain simplicity, decision, and even humorousness characterises the seventeenth century work of this early kind. Architectural façades, the insides of rooms, &c., are often found as the decoration of panels and table tops belonging to this period. The object is to do as much as possible by the juxtaposition of woods, and the ingenious use of the natural lines and curves in the grain of the wood. Often such work was made in two woods only, or in ivory only, besides the wood that forms the groundwork. Various methods were employed to help out the graphic effect of the little figures, subjects, or patterns. Burning either with iron or hot sand, by which parts of the lighter coloured material inlaid

are shaded or darkened, so as to express the varieties of colour between yellow and warm brown, was one method. Etching with a graving tool was another.

In France, however, in the reign of Louis XIV.,—so splendid an epoch for writers, statesmen, generals, and magnificent gentlemen—was produced, also, a new and very costly style of furniture. This went by the name of the first maker, André Charles Boulle, and was called Boulle (or, as it is sometimes mis-spelt, Buhl) marquetry. Whether Boulle was or was not actually the inventor of marquetry in tortoise-shell, ivory, brass, and white metals, which goes by his name, has been questioned. Boulle was born in 1642, and died in 1732. He was made head or director of the Royal establishments, and was lodged in the palace of the Louvre. He was employed to furnish the new Château of Versailles, and obtained a great name all over France. There are several excellent examples of modern Boulle cabinet work in this Exhibition. The peculiarity of Boulle's invention was the employment of thin slices of metal, ivory, and tortoiseshell. In his earlier works we find coloured enamelled metal. But later Boulle work was simpler, and took bolder and larger forms than these early specimens. The general form of furniture was now changed. Carving was no longer required on cabinets or on table-legs and bars. Everything was sacrificed to surface ornament. To vary this surface, Boulle adopted a system of curved and recurved surfaces, so as to give effect to the lustrous material that covered it.

We may illustrate this period of furniture by the table and other Boulle contributions of Mignienne, and by those of Wertheimer. The large commode by the latter, though square and upright, finishes with pedestals for a clock and chandelier; a common form in such furniture.

Metal mounts now became important parts of the decoration of furniture, as we shall see on referring to the examples exhibited this year. Boulle work is costly and laborious, and is rarely made by our English cabinet makers, except in small fancy articles. Two thicknesses, or three, but usually two, of material—shell and metal, or metal and wood—are glued together. The pattern is drawn upon the outer surface, and a small hole bored where the pattern will not show it. Into this hole a fine riband saw is introduced, and the entire figure cut out. When the thicknesses of material are separated, there are, of course, two (or more) figures, and as many openings, exact counterparts one of the other. The later Boulle work was made in this way, always in the double, so that by fitting each figure into the matrix or vacant shape of the other material, a double veneering was obtained from the same operation, technically called "*Boule*" and "*counter*"—brass in shell and shell in brass. But the earlier and rarer pieces of Boulle were made at more cost; the refuse, or alternate ground or pattern, was thrown away.

The use of the curved surfaces was not confined to Boulle marquetry. Bombé, or bulging cabinets, chests of drawers, &c., became a fashion during the reign of Louis XV. They were inlaid with marquetry of coloured woods; and carefully-made specimens of that work are now much valued.

The political events connected with the revocation of the Edict of Nantes, in 1686, drove numbers of clever workmen to Holland. Daniel Marot and others were patronised by the Stadtholder, and French furniture designs became the fashion in Holland. The bulbous, bandy-legged marquetry chairs we see in old houses of William III. and Queen Anne's reigns, owe their origin to this French, and then Dutch, source. We have no marquetry in this year's Exhibition that represents this heavy but picturesque fashion. Other marquetry of the last century in England was made of holly let into walnut, sometimes varied with pear, &c. The designs are generally more elegant than those of birds, &c., derived from the Dutch. This last light work has never been reproduced, as far as we know, by modern cabinet-makers, nor have we any illustration to point to in the year's Exhibition.

To the same period on the Continent—that is, the early half of the last century—belongs the brilliant gilding so well known as Louis Quatorze, or Louis Quinze ornamentation. The severe lines and mouldings of the semi-Classic taste of Louis XIV. gradually gave place to a gay, broken, shapeless system of outlines, partly suggestive of shells and broken curves and spirals, easily cut in light wood, and peculiarly suited for showing off gilding. As the costume of the day, and as the manners of the period became "modish" and affected, so did this taste in furniture. Still, in glass frames, room panels, &c., it is not without a certain remnant of grace. Our own country followed the fashion, and we find old carved mirror frames and wood-work executed in

* This was purchased for the National Collection, and is now in the South Kensington Museum.

the same taste. Cabinet-makers of the name of Chippendale made this work famous. We meet with looking-glasses of which the frames are cut into Chinese landscapes of a fanciful kind, by Thomas Chippendale. The father's work was more strictly in the French taste.

The Italians during this period produced far superior gilt frames, console tables, &c. They cut compositions of great acanthus leaves, rolling and curving over in magnificent sweeps. Examples are to be found in private collections. The Italian carvers of Florence have fine soft wood, which they could cut boldly with sharp tools. Some of these graceful frames give one the impression of having been carved out by sweeping single cuts.

The Italians were admirable gilders. We see examples in the table supports of Bazzante in the Italian picture gallery.

They had for centuries the secret of preparing a matted ground on which to lay their gold, which was pure and thick. The ground was worked over delicately with tools, and the utmost richness of effect obtained by these simple means. But, in the last century, they undercut and rolled over their acanthus leaves in the huge sweeps described; and the edges, ribs, hollows, and surfaces when well gilt, were more effective, though less sparkling, than the more uneasy broken forms found in Louis XV. period and the Chippendale gilder's work.

Two makers, of well-known reputation, gave their name to furniture towards the close of the last century in France. The best known is Reisner, who was born about 1740-50, and worked in mahogany, snake-wood, and marquetry. His work is highly prized, and still sells for large sums. His marquetry is graceful in line and well composed. He was fond of delicate colouring, such as inlaying maple or sycamore or other light coloured woods with others also very delicate in hue. He leaves spaces of his ground-work unoccupied, divides his whole composition in the middle, where the two drawers of his commodes meet, and keeps side panels very quietly diapered or laid out with flat arrangements of simple patterns.

With him was associated a metal-chaser of the name of Gouttière or Gouthière. The woodwork of one was mounted with bindings, legs, edges, and lock-plates, &c., exquisitely modelled and chiselled by the other. We meet with work of Gouttière in modern sales. Other names connected with this sort of furniture are known of, but these two the most.

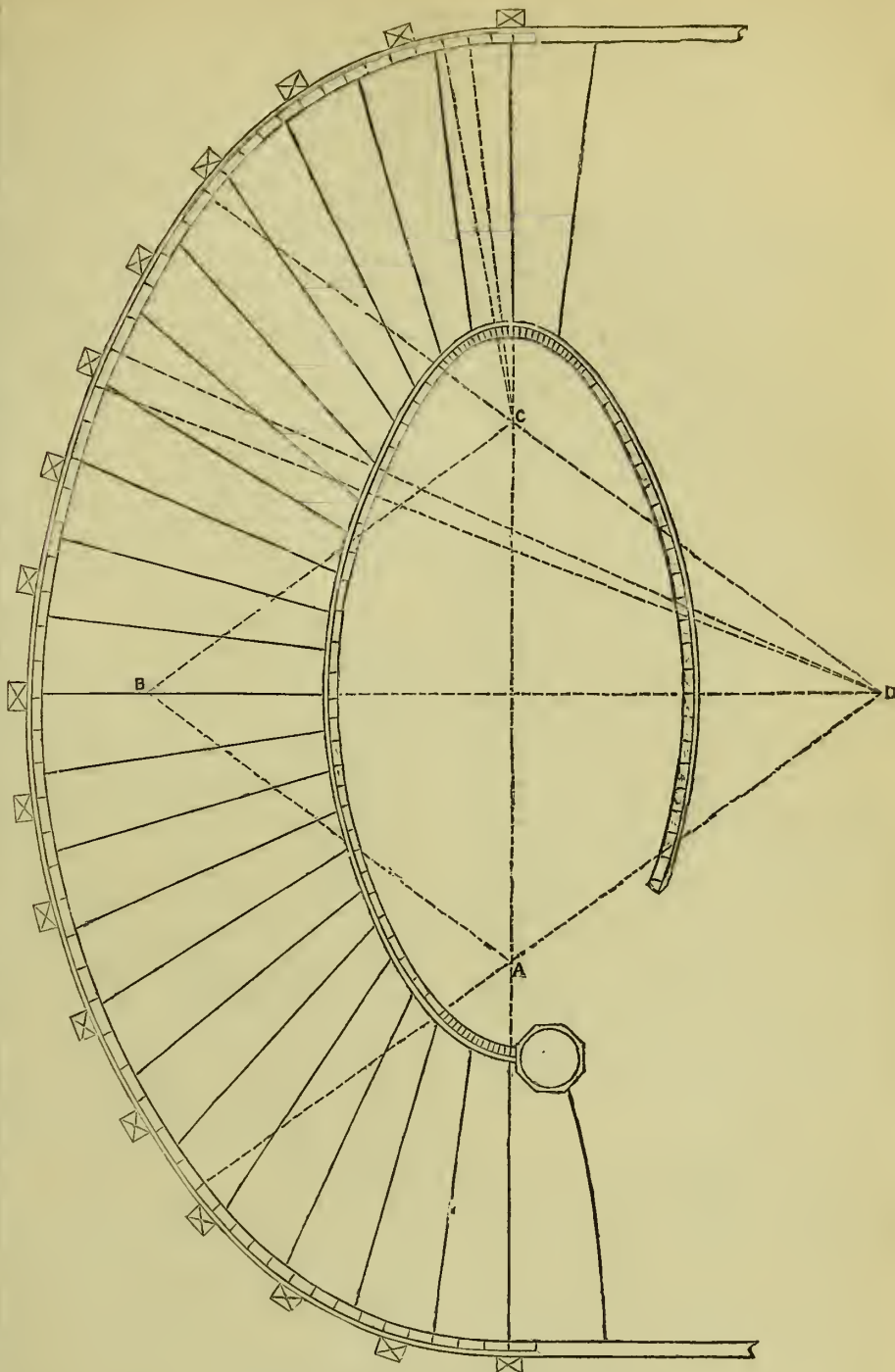
The Italian makers also followed the same fashion of work. The Venetian, Milanese, and Florentine makers produced marquetry in the same style, but with less finish and delicacy. The two makers we have named furnished the "Trianon," a small house in the park at Versailles, the favourite residence of Queen Marie Antoinette. They continued to work for the Court till the overthrow of the Monarchy.

(To be concluded next week.)

CHINESE VARNISH.

AMONG the raw-stuffs sent by Dr. von Scherzer from Pekin was one called schio-lia, a kind of varnish which is employed for varnishing all kinds of wooden things, and has the property of making these articles watertight. Dr. von Scherzer has seen wooden chests in Pekin which have been over Siberia to S. Petersburg and back, and still remain sound and watertight. Even baskets of straw used for the transport of oil are, by means of this varnish, made perfectly fit for the purpose. Pasteboard, by its use, becomes, both in appearance and firmness, like wood. Most exposed woodwork is coated with schio-lia, which gives it an ugly, red appearance, but it gains in durability. This varnish was examined by the Australian Agricultural Department, and Dr. von Scherzer's communication was fully corroborated. The "Wiener Gewerbeverein" also made trials with it. By mixing together three parts of fresh, beaten, defibrinated blood, four parts of slacked lime, and some alum, a thin, sticky mass is obtained, which is immediately ready for use. Articles which are required to be particularly watertight are varnished twice or at most three times by the Chinese. In Europe this varnish is not yet made, although it is one of the surest and best ways of making wooden articles perfectly watertight.

The new Department of the Fine Arts, as it is called, in University College, London, will be opened on October the 4th next, under the direction of the Slade Professor, Mr. E. J. Poynter, A.R.A. Much remains to be done to the extensive suite of buildings which have been erected for this new school, but no doubt exists that everything will be ready in time.



NEW ELEMENTS OF HAND-RAILING.—PLATE XL.

NEW ELEMENTS OF HAND-RAILING.*

(Concluded from page 78.)

PLATE 40.—ELLIPTICAL STAIRS—WALL AND FRONT STRINGS BENT BY KERFING.

THE ground plan of these stairs is struck from centres A, B, C, D. The principle being the same as that laid down in the first plate.

By the use of more centres than are here given, the figure could be made to present a more perfect oval. But such a method would cause the kerfing to be complicated and rather difficult.

The chief object to be had in view is to show a method of bending the strings with the least possible amount of work.

It is true, that the figure under consideration may not present to the eye those beautiful curves created by a pure ellipse: but we must bear in mind that the plan we look upon is on a flat surface, and therefore incapable of giving even a remote idea of that long extended rising curve which in its elevation would seem to sweep far beyond the limit laid down for it on the plan. And yet the stairs stand directly over this flat representation.

Viewing this stairs from an upper floor, and looking downward, perhaps a better idea may be formed

of the curve on its stretch-out; and even then, not one in a hundred could fairly decide whether the plan was a true ellipse or its imitation.

There are very many objections (some of them serious ones) to the old and slow method of constructing circular strings. Just think of the amount of labour thrown away in building cylinders, forms, and other fixtures, for no other purpose but to bend strings over.

This tedious and expensive mode may be entirely dispensed with, by the adoption of the new and much advanced system of kerfing; which I certainly would not advocate in this work if there was a single doubt as to its practicability. But, having seen kerfing thoroughly tried, and its application to bending, not only strings of stairs, but other work, practically tested in such a manner as to leave no doubt whatever of its perfect reliability, I have not the least hesitation in urging its adoption in all cases where certainty of effect, shortness of time, and economy of material are matters worthy of consideration.

In conclusion, I would say, it is thought that the explanations are sufficiently clear, and I am fully confident that the drawings comprising the several plates are in themselves perfect; for, from close and constant inspection, I can state with certainty that there is not a single error in any one of them. So that the workman can be fully assured of the cor-

*This series of articles is a reproduction of ROBERT RIDDELL's work on the subject, published in Philadelphia, and by Trubner and Co., London.

rectness of every line, and depend with confidence on the truth and certainty of all and each of the instructions contained in this volume; which shows the art of STAIR-BUILDING fixed on a firm basis, and made a perfect and pleasing science.

PROPOSED VESTRY HALL FOR CAMBERWELL.

THE Committee lately appointed by the Vestry of Camberwell to consider the building of a new vestry-hall, presented their report at the last meeting of the vestrymen. The Committee recommend that the accommodation to be provided should be:—A hall 25ft. high, to accommodate 100 members of the vestry, the officers and reporters, and a public gallery to hold 100 persons; two committee rooms (each), 30ft. by 20ft.; one committee-room, 24ft. by 16ft.; one waiting-room (ground floor), 18ft. by 15ft.; one waiting-room (up stairs), 18ft. by 15ft.; accountant's office, 25ft. by 16ft.; hat and cloak room (ground floor), 18ft. by 15ft.; hat and cloak room (up stairs), 18ft. by 15ft.; Burial Board office, 18ft. by 15ft.; messengers-room (near entrance), 16ft. by 12ft.; vestry clerk's office (public), 25ft. by 17ft.; vestry clerk's office (private), 20ft. by 16ft.; assistant overseer's office, 30ft. by 20ft.; surveyor's office (public), 25ft. by 17ft.; surveyor's office (private), 20ft. by 16ft.; medical officer and sanitary inspector's office, 24ft. by 16ft.; laboratory and gas-testing room; two strong rooms; for housekeeper, four rooms and a kitchen; lavatories, yard at the rear, covered carriage-shed for vehicles to draw under, and labourers' pay office. The Committee recommended the vestry to offer premiums of £50 for the first, and £25 for the second selected designs, both to become the property of the vestry; but should the author of either of these be employed as the architect of the building, then the premium will not be given, but he will be paid the usual commission of five per cent. on the amount of the accepted tender. As to cost, the Committee proposed that the building, with all its requisite offices, fittings, warming, ventilation, lighting, drainage, enclosure-walls, and railings, and all incidental works and charges, architect's commission, clerk of the works' salary, &c. (exclusive of furniture), shall not exceed the sum of £10,000. The report was adopted, except as to the amount of outlay, it being decided, after discussion, that competing architects should be instructed that the cost is not to exceed £8,000, so as to set aside the remaining £2,000 for contingencies.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

THE ESSEX ARCHÆOLOGICAL SOCIETY.—The annual meeting of the society was held at Chelmsford on 10th inst. The report and statement of accounts having been read and adopted, the Rev. H. A. Lipseomb made an interesting statement relative to an old book—an *Antiphonale*—found in the roof of Springfield Church during the restoration, about three years ago. The book was discovered above the south wall. It was within oak boards, but they were exceedingly rotten. It had since been bound in leather by the librarian at Cambridge University, who pronounced it to be remarkably perfect. The book appeared to be of date about 1300, and it was probably hidden in the roof in the time of Edward VI., in consequence of a statute providing that the "old church books should be abolished and extinguished." Mr. J. Edward K. Cutts next read a paper on "Some Roman and British antiquities found at Billericay, and some Roman antiquities at Dunmow," some fragments of which were placed on the table. After luncheon at the Suracen's Head, the party started for Broomfield Church, Leighs Priory, and the site of Pleshey Castle. Broomfield Church was described by Mr. Chancellor, under whose direction it has recently been restored. Mr. Chancellor said the nave was undoubtedly the oldest portion of the work. He confessed, after a minute examination of the south wall, with the western returns, that he entertained a strong belief that the work was Roman; and, pointing out what appeared to be the lines of an old arch, he suggested the possibility that it was some Roman building altered by the Normans. In the south-east corner of the nave he directed attention to two Roman bricks, which were the largest he had ever seen. The chancel he attributed to the latter part of the fourteenth century, while the tower—one of three round towers in Essex—he described as a fine specimen of Norman public work. One of several articles shown to the visitors by the Rev. J. B. Whiting, vicar of the parish, was a large Bible, printed in 1629, and having a very elaborate binding, which bore on the inner cover the following written inscription:—This Bible was King Charles first's; afterwards it was my grandfather's, Patrick Young, Esq., who was Librarian-keeper to His Majesty, now given to the

church at Broomfield by me, Sarah Atwood, Aug. ye 4th, 1723." The company then proceeded to the parish of Little Leighs, for the purpose of viewing the ruins of the Priory, founded by Ralph Gernon, temp. Henry III., for Augustine Friars or Black Canons. Originally, it was a magnificent pile, surrounded by a park of many acres. At the dissolution of the monasteries in the reign of "Bluff King Harry" VIII., the building and a large portion of the property connected with it fell into the hands of Sir Richard Rich. After the buildings had been inspected, the Rev. E. L. Cutts read some "Notes on some Mediaeval Fountains." In the course of some conversation which followed, Mr. Chancellor mentioned, amid laughter, that eighteen or twenty years ago, when the fountain at Leighs was more perfect than at present, he sent a drawing of it to the *Builder*, but the editor inserted a note to the effect that it was not worth engraving. He undertook, however, at the desire of those present, to make another drawing, with the view of its being issued with the journal of the society's transactions. The company next visited Pleshey, said to have been a Roman settlement. The old castle, the origin of which is involved in some obscurity—the first mention of it of which we are aware being in the reign of King Stephen—was doubtless a building of great magnificence. Shakespeare, in his play of "Richard II.," mentions it more than once. Next year the excursion will be to Danbury, the seat of the Bishop of Rochester.

ARCHÆOLOGICAL.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The twenty-eighth annual country meeting of this society will be held at Weymouth in the week commencing Monday next, the 21st inst., under the patronage of the Earl of Shaftesbury and the Bishop of Salisbury. Sir W. Coles Medleycott, D.C.L., is the president, and there is a long list of noble and learned vice-presidents. The programme, as just settled, is very attractive. The congress will occupy the whole of the week; on the opening day, after the inaugural address has been delivered, the local objects will be examined; and the annual dinner will be held the same evening. There will be daily excursions on each of the remaining days of the week to numerous places of interest, including the Isle of Portland, Dorchester, Bindon Abbey, Wareham, Corfe Castle, Maiden Castle, the Monastery of Abbotsbury, Cerne Abbey, &c. There will also be sectional meetings every evening for the reading of papers, and among the readers of papers already decided upon are the Rev. Prebendary Searth, Mr. W. H. Black, F.S.A., Mr. Cuming, F.S.A., Mr. F. Dillon Croker, F.S.A., Mr. J. O. Halliwell, F.R.S., F.S.A., Mr. Levien, M.A., F.S.A., Mr. E. Roberts, F.S.A., Mr. Thomas Wright, M.A., F.S.A., and Mr. G. R. Wright, F.S.A. The subjects also are unusually interesting.

DISCOVERY OF A STONE COFFIN AT HIGH ONGAR.—A few days since, as some labourers were cutting a trench on a farm road at High Ongar, they discovered, about 6in. from the surface, a stone coffin, the lid of which was 6in. thick, and 6ft. 8in. long by 2ft. 2in. wide. The lid has a slight ridge in the middle, but no inscription. On examining the interior of the coffin three or four bones were found. The coffin appears to have been chiselled out of a block of Portland stone, of the size of the lid, and about 18in. deep, leaving the sides, ends, and bottom, 4in. in thickness, the inside of the coffin measuring 6ft. by 18in. The spot where the discovery was made is nearly a quarter of a mile from the church, and nearly one mile east of Ongar Castle Mount, on the summit of which a few bricks only now remain.

PARLIAMENTARY NOTES.

THE POLLUTION OF RIVERS.—In reply to Mr. Dimsdale, Mr. Bruce said (on Friday) that, if the measure which had passed through that House received the Royal assent, this subject of the pollution of rivers by sewage would pass into the hands of the Poor-Law Board. It would certainly be one of the subjects that would be submitted for consideration next session.

THE MUSEUM ON BETHNAL-GREEN.—Mr. C. Reed asked the First Commissioner of Works whether he would order a report to be made forthwith upon the plan and design of the proposed museum on Bethnal-green, with a view to ascertain the extent of space available for collections of works of art, for the exhibition of pictures, and for the purposes of study.—Mr. Ayrton said that there would be no objection to have such a report published, and, if moved for, it would be produced.

THE REPORT OF THE THAMES EMBANKMENT COMMITTEE.—Mr. W. H. Smith asked the First Lord of the Treasury whether her Majesty's Government would take measures to give effect to the report of the committee on the Thames Embank-

ment by appropriating to the use of the public, in the manner recommended by the committee, the portion of foreshore reclaimed from the Thames near Whitehall; and whether, if further legislation is required in order to give effect to that object, the Government would undertake that the land in question should not, in the meanwhile, be dealt with in any manner inconsistent with the recommendation of the committee.—Mr. Gladstone said that he had not yet seen the evidence that had been taken, and he apprehended that it was not yet published. He thought that it would be better that the matter should be taken into consideration after they had considered the report; but certainly the Government would not take any measures to prevent a fair consideration of that report by Parliament.

BENEFIT BUILDING SOCIETIES.—Mr. W. H. Smith on Tuesday asked the Chancellor of the Exchequer whether the following letter sent from the Inland Revenue, dated the 4th August, 1871, was written at his instance or with his knowledge:—"Gentlemen,—The attention of the Commissioners of Inland Revenue having been directed to the fact that cheques drawn on behalf of building societies on their bankers have been very generally and erroneously regarded as exempt from stamp duty, I am directed to inform you that these documents are liable to stamp duty like other cheques, and remind you that any person who pays any cheque liable to duty and not stamped incurs a penalty of £10.—I am, gentlemen, your obedient servant, WM. LOMAS." And whether, considering the many inconveniences which would arise, the Chancellor of the Exchequer would instruct the Solicitor to the Inland Revenue to withdraw the above letter until after next Michaelmas term, in order that the opinion of the Court of Exchequer of Pleas may be taken on the validity of exceptions now claimed by building societies?—The Chancellor of the Exchequer replied that the letter set out in the question was not written at his instance nor with his knowledge. An offer had been made by the Inland Revenue to the gentleman who represented these societies to refer the whole question to the Court of Exchequer, but as that offer had been refused, and the matter involved an important item of revenue, he would not feel justified in ordering the withdrawal of the letter.

THE CHOLERA.—Mr. Denman asked the Vice-President of the Privy Council whether his attention had been called to a letter from Dr. Edmunds in Tuesday's papers, stating that at half-past two in the morning he had been called to a typical case of Asiatic cholera, and whether any steps had been taken in consequence.—Mr. Forster replied that he had been informed by the medical officer of the Privy Council that immediately he saw this letter Dr. McAdams was sent from the office to examine into the case, and make a report, and he was very glad to find from that report that there was reason to believe it was not a case of Asiatic cholera, although there were symptoms at first which might have excited suspicion. The patient seemed to be a respectable artisan, who was employed in some works, and was also a school teacher. He was taken ill on the previous night on his return from a school treat, and when Dr. Edmunds was called in the man appeared to have a bad attack of cholera, but there was reason to suppose it was sporadic cholera. At any rate, the patient was now much better. He could have wished that Dr. Edmunds had waited a few hours before writing to the papers, and not excited needless alarm until he had ascertained whether he was right or wrong in his suspicion. It was his first duty to communicate with the sanitary authorities of Marylebone, and he trusted that in all other cases of the kind, whether in London or the provinces, that course would be adopted by medical men, so that the sanitary authorities might immediately set to work to disinfect.—Mr. W. H. Smith inquired whether any special instructions had been issued by the Privy Council with regard to the cholera?—Mr. Forster said that a few days ago the officer of the Medical Department submitted for his approval a series of instructions drawn up with great care, and intelligible not only to medical men, but to the public generally. He believed they were already issued, but if they were not, he would take care that they were immediately issued in such a manner that the public should be made acquainted with them.

ALEXANDRA PALACE.—It does not appear to be generally understood that the magnificent structure at Muswell Hill has been erected at a large outlay, to cover all modern improvements in public buildings. The views from the terraces and the interior of the building resemble the sight from the Malvern or Surrey Hills, and are unequalled. The railway facilities, which will soon be completed, will give to the northern and eastern inhabitants of this vast city, and thousands of excursionists, one of the finest and best recreation grounds in Europe. The public investors are to be covered by insurance of 20s. for every 21s., so that no risk whatever is incurred, and the profits every year are cumulative in advantages.

Building Intelligence.

CHURCHES AND CHAPELS.

ABERGWESSIN.—The Church at Abergwessin, which has been recently restored, was opened for divine worship on Thursday, the 3rd inst. The structure is of very ancient origin, situated in a rude part of the country, on the borders of the counties of Brecon and Cardigan. The style is Early English of the thirteenth century, and the building consists of nave, chancel, and transepts, with tower at intersections, and porch at west of south side of nave. The dimensions are as follows:—Nave, 50ft. by 19ft.; chancel, 18ft. by 9ft.; transepts, 17ft. by 9ft.; and tower, 26ft. square. The walls are built of native stones faced externally with red Suffolk brick, the lower four feet being glazed, and the interval stones from the Bath quarries. The external dressings are of Greenshill and Cefn quarries. The roofs are covered with Whitland Abbey slates, surmounted by a red Staffordshire ridge or crest. A figure of S. Michael, to whom the church is dedicated, is placed in a niche over the south porch doorway. In the nave there are movable open benches to accommodate about 120 persons. The works have been carried out from the designs and under the superintendence of Mr. R. J. Withers, architect, of 11, Adam-street, Adelphi, London, by Messrs. Dove, Bros., builders, Islington, London.

ALDBOROUGH.—The parish church of Aldborough in Holderness, Yorkshire, has considerable traditional and historical interest. It is supposed that the present church, dedicated to S. Bartholomew, succeeded, some hundreds of years ago, a much older structure, which stood on land long since swept away by the encroachments of the sea, which are still going on to the east coast. About three years ago commenced the work which has happily resulted in the complete restoration of the church. The nave and aisles have been rebuilt, and an arch on each side added and the chancel restored, at a cost of about £1,800. The architect is Mr. Perkin, of Leeds, and the contractors Messrs. Weatherly and Rymer, of York.

BIRMINGHAM.—The laying of the memorial-stone of the new Welsh Independent Chapel in Wheeler-street took place on Tuesday week. The dimensions of the chapel will be 48ft. 6in. by 29ft. 6in., with a gallery at one end. It has been designed by Mr. Ingall, architect, and, with the school, will cost about £1,100.

HALSHAM.—All Saints' Church, Halsham, Yorkshire, was on Thursday week reopened by the Archbishop of York. The restoration of the building has been in progress for about two years. The chancel had formerly a coved roof, but that has been taken away and replaced by a roof of open wood-work. The roofs of the nave and south aisle have been entirely renewed, but the north aisle is still in a dilapidated condition. The south aisle is divided from the nave by three bays, the arches resting on plain octagonal pillars, and the north aisle is divided from the nave by two arches, resting upon an old Norman circular column. The church has been re-seated with open benches of stained deal. The architect is Mr. Ewan Christian, of London, and the contractor, Mr. Charles Atkinson, of Roes. The restoration has cost about £1,000.

LOUGHTON, ESSEX.—The foundation-stone of a new church, to be dedicated to the Blessed Virgin Mary, was laid on Tuesday last, by John Williams, Esq., J.P., of Debden Hall, in a large assembly of clergy, the county members, and most of the influential families of the neighbourhood, together with a large concourse of the people of Loughton. The Rev. John Whitaker Maitland, the rector, addressed the assemblage, and was warmly congratulated that his great desire for increased church accommodation was so shortly about to be realised in that portion of his parish. Nearly £350 was laid as offerings on the stone, and some interesting gifts were mentioned, as a memorial window, £50 from a friend at a distance, for the decoration of the south porch. The church will consist of nave and aisles, chancel and chancel aisles, north and south transepts, vestry, &c. Bath stone is to be freely used, internally and externally. The facing will be of Godalming stone from Messrs. Lisley's quarries, in random work, brought up to stretching courses of squared stone, with plain tile bands laid as headers sparingly introduced. The roofing will be of plain tiles, with tile hip knobs and crockets, to be made by Mr. Cooper, of Maidenhead. Mr. John Bentley, of Waltham Abbey, is the builder, whose contract is £3,300, and accommodation is provided for 500 persons. A more detailed description will be given when the church is finished. The architect is Mr. Thomas Henry Watson, of Nottingham-place, London.

MANCHESTER.—The new church of S. John the Evangelist, Hightown, Cheetham, was consecrated on Thursday week by the Right Rev. the Lord Bishop of Manchester. This church and its adjuncts, the entire cost of which is stated to be £20,000, is the munificent gift of Lewis Loyd, Esq., of Monk's Orchard, in the county of Kent. The church, which stands in a commanding position, is built of stone lined with brick, and in the Early English style. It consists of a nave, north and south aisles, chancel, and semi-circular apse, with a tower at the south-east side of considerable altitude, having a low spire, with pinnacles at the angles, which, together with the main roof, are covered with tiles. The aisles are lighted with small lancet windows. There is an arcade round the chancel, and above that a series of lancet windows. The pulpit is octagonal, perforated with Gothic tracery. Accommodation is provided for 540 worshippers, 170 sittings being free. A parsonage-house has been erected upon the site. Architects, Messrs. Paley & Austin of Lancaster. Contractors, Messrs. Robinson, of Hyde.

NEWTON ABBOT.—For some time past the accommodation afforded at S. Paul's Church, Newton Abbot, built and endowed some eight or ten years ago by the Earl of Devon, has been found to be totally inadequate. Recently a fund was started for enlarging the church, by adding another aisle to it, whereby something like seventy additional free sittings would be provided. Nearly sufficient money has now been raised, and on Saturday last Lord Devon attended and laid the foundation-stone of the new aisle. The work will be carried out by Mr. J. Steer, builder, of Newton, after designs by J. W. Rowell, Esq., architect.

NORMANTON.—On Monday, at the village of Normanton, near Wakefield, the memorial-stone of a new Congregational church was laid. The new building, for which Mr. Harris, of Leeds, is architect, will be in the Gothic style, adapted to modern requirements. The cost is estimated at about £702, inclusive of £250 for the land. Sitting accommodation will be provided for 250.

S. CLEMENT DANES CHURCH.—On Monday evening a meeting of the Vestry of S. Clement Danes was held in the Vestry-hall, Strand, for the purpose of considering a proposal which has been made by the Chancellor of the Exchequer, through Mr. Street, to remove the church of S. Clement Danes, in order to make proper approaches to the new Law Courts. The Rev. R. J. Simpson, M.A., the rector, presided, and it appeared, in the course of conversation, that Mr. Lowe proposes to give a site on the ground obtained by the Government, and to erect upon it a handsome church in accordance with the architectural character of the Courts, with a parsonage-house and schools. Some communications have passed between the Government and the Metropolitan Board of Works. Plans were produced and explained by Mr. Street's clerk, but it appeared that Mr. Street himself had left town, and had not sent any authority from the Chancellor of the Exchequer to treat upon the matter. Mr. Innes, solicitor, of Norfolk-street, denounced the proposed scheme, spoke in enthusiastic terms of the noble church in which the parishioners were accustomed to assemble, and which he considered ten thousand times better than any of the Gothic churches which it was the present fashion to erect. Eventually it was determined that, under the circumstances, the Vestry should take no active steps in the matter until it came more formally before them, and that afterwards the parishioners generally should be consulted by means of a public meeting. In the event of S. Clement's Church being removed, it will be necessary to have a general clearance of all the blocks of buildings which stand westward of it, and the removal of which very few people will be disposed to regret.

WELSHPOOL.—S. Mary's Church, Welshpool, after restoration at a cost of £4,000, was reopened on Tuesday week. The restoration has been effected by Messrs. Fisher and Dyson, contractors, of Huddersfield, from plans by Mr. Street, R.A. Four new windows have been placed in the south side, three of stained glass. The ceiling has been entirely removed, the rafters cased and remodelled, and thrown open, being done in pitch pine. The floor has been lowered, and new bases have been put to the piers of the arcade arches. The seats will accommodate 1,200 persons. The reredos is of alabaster and marble, with a large cross in the centre. A new arcade has been opened at the west end, with two new arches, the whole nave having been lowered to the level of the early church.

YORK.—It is proposed to restore the church of S. Crux, York, from designs by Messrs. J. B. and W. Atkinson, of that city. The principal alterations will be the entire removal of the clerestory

walls, the columns and arcades being too weak to support them, and to have a new open and high-pitched roof, in which small three-light clerestory windows will be inserted, and the roof kept sufficiently high at the apex, so as not to interfere with the large east window. The tower will be taken down and not rebuilt, and in its place a bell turret, springing from the west end of the nave roof, will be provided.

BUILDINGS.

ACCRINGTON.—On Friday week the corner-stone was laid of a new school for the parish of S. John the Evangelist, by Mrs. Peel, of Knowlmere Manor. The building is in the form of the letter L, having a girls' school 46ft. by 20ft., class-room, 20ft. by 15ft. with entrance porch, passage between school and class-room to playground, and small book closet. Boys' school (placed to the west of girls' school), 44ft. 6in. by 20ft., with class-room, 20ft. by 15ft. (with heating vault under same), and entrance porch. At some future time when this school is inadequate for the requirements of the parish, an infants' school will be erected at the east end of the girls' school. The style of the school is fourteenth century, and accommodation is provided for 300 scholars. The external walls are being erected of pier points and brick lining, with cavity between. The roofs are open timbered, ceiled at the collar, giving a height of 19ft. The whole of the woodwork will be stained and varnished. Spacious playgrounds are provided at the back of school, and in the front will be dwarf walls, surmounted with ornamental iron railing. The various works are being executed for the sum of £1,430, by William Ramsbottom, mason; James Hindle and Sons, joiners; R. Holden, slater; D. Carter, plumber; R. Hodgson, plasterer; R. D. Riley, painter; from the plans and under the superintendence of Mr. William S. Varley, architect, Blackburn.

HEATON MERSEY.—A new certified and industrial ragged school, to be known as the Barnes Home, in commemoration of the gift of Mr. Robert Barnes, has been formally opened. The new building has been erected and furnished at a cost of £12,000 on an elevated site on the Bank Hall estate at Heaton Mersey, five miles from Manchester, and is in the Gothic style. The total frontage is 196ft. and the depth 242ft. The central part of the building is three storeys high, of brick, with stone dressings. The principal feature in the front elevation of the central part of the building is a tower, with chamber for the reception of a clock, surmounted with a slated spire, the total height of which is 111ft. The principal entrance is under the tower, and leads to a spacious hall, thence to a corridor running right and left the full length of the building. There will be accommodation for 200 boys, with resident masters, assistants, servants, and residence for the governor and matron. At the back of the school premises are the farm buildings. The architect is Mr. H. Pinchbeck, and the whole of the works have been satisfactorily performed by Messrs. Thomas Clay & Sons, of Manchester.

LONDON.—Wood-street-square, Monkwell-street, London, is being rebuilt by Mr. Henshaw, from plans by Mr. Herbert Ford. The shop fronts towards the square have granite bases to the piers, which are built of white glazed bricks, the general facing of the fronts above being of perforated bricks. The building is bounded on the north and west by Cripple Gate Churchyard, and a portion of the area is the site of the celebrated Lamb Chapel, which possesses one of the few examples still existing in the City of the old Norman crypt. Alterations in connection with the superstructure at different dates have much interfered with the old Norman works, but enough remains to make it an interesting study of detail. One portion of these new warehouses will be built upon an old circular bastion, forming part of the old City wall, the portion remaining being about 15ft. high and 5ft. thick.

MELTHAM MILLS.—The new Convalescent Home at Meltham Mills, near Huddersfield, founded by Mr. Charles Brooke, was opened on Thursday fortnight. The building, which is in the Domestic Gothic style, has been erected from designs by Mr. E. Birchall, of Leeds, under the direction of Messrs. J. Kirk & Sons, of Huddersfield. It will accommodate sixty persons, and is entirely of stone. Facing the north-east, the main front is 190ft. long. In the centre, a little projecting, is the administrative section, above which rises a tower; and on each side extend the sections allotted to the patients, the accommodation for whom allows of sixty being resident. To the rear of the main front, and approached by a long corridor, is a large dining-room, 50ft. long by 24ft. wide, with lofty ridge-shaped roof, open to the top. Beyond the dining-hall are the kitchen and rooms connected therewith, and servants' rooms;

and on the far side of a great yard is accommodation for stabling, coals, and washing. The patients' rooms on the east side of the administrative section are intended for males, and those on the west side, of exactly equal size, for females.

OSSETT.—The new bank premises for the Wakefield and Barnsley Union Banking Company were opened for the transaction of business on Tuesday week. The bank has a frontage of 40ft to Town-street, and 50ft. to a new street running at right angles therefrom. The design is Classic, and is executed in hard Huddersfield stone—the entrance to the bank is in the centre of the front elevation, and is a spacious circular-headed doorway, and right and left are two circular-headed windows; above runs a moulded cornice and frieze. The entire cost of building and fittings is £2,450. The contract for the whole of the buildings was taken by Messrs. Eastwood & Tolson, of Ossett, and for the bank fittings by Messrs. Craven & Lloyd, of Wakefield—from the designs and under the supervision of Mr. W. Watson, of Wakefield, architect.

PLYMOUTH THEATRE has recently been decorated by Messrs. Fouracre and Son, of Devonport. The decorations are after Greek examples, and treated as "flat" ornament, no shading or attempt at sham relief having been resorted to. The columns supporting the elliptical arch of the proscenium were features requiring thoughtful treatment, on account of their excessive height as compared with their diameters. The boxes, &c., about on these, and are supported by them. Banding these columns at the junctions of the above named has been resorted to. Their great slenderness is apparently diminished while it does not interfere with the impression of height of proscenium. The soffit of the arch has been panelled, and ornaments occupy the centres of panels surrounded with a powdering of gold stars on a blue ground.

PUDSEY.—On Saturday week the foundation-stone of a large co-operative store was laid at Pudsey. There will also be two dwelling-houses, and over the whole a large room for the use of the committees and shareholders at their meetings. The designs, which are in the Italian style of architecture, have been furnished by Messrs. Wilson and Bailey, architects, Leeds.

RUGELEY.—The new hospital was opened at Rugeley, last week. The general character of the architecture is Domestic Gothic of the English variety. It is built of the red bricks of the locality, relieved with blue courses round the building and over the arches of the windows, with a moulded blue projecting course half-way up the building. The windows and doors have stone sills, and the arches stone springers and keystones. A cornice is carried round the hospital, under the eaves of the roof, consisting of blue brick corbels, with white bricks between. The building was specially contrived for comfort and convenience, on as small a ground area as possible, and is calculated to hold eighteen beds, giving a little over 1,000ft. to each patient; and the building is expected to cost, including furniture, £1,600. The contractors are Messrs. Brown, Rugeley.

SHAFTESBURY.—The Westminster Schools, at Shaftesbury, were opened on Monday week, having been built at the expense of the Dowager Marchioness of Westminster. The whole of the walls are built of green sandstone, Box Ground stone having been used for the dressings. The plan is in the form of a double L. The girls' school room is 40ft. by 20ft., lighted by four two-light and one eight-mullioned and transomed windows. Classroom 32ft. by 16ft., lighted with three two-light mullioned and transomed windows. Cloak-room lighted by one three-light mullioned and transomed window. The boys' school, class, and cloak rooms, are the same dimensions, and similar in plan to those of the girls. The whole of the roofs are open-timbered, three pair of wrought and moulded ribs to each room, supported on moulded stone corbels. The whole of the roofs are covered with slates, the porches and doorways to lobbies are formed of moulded stonework, the heads being finished with good labels and carved terminations, a tablet with inscription being set over each doorway. Over the principal elevation of boys' school there is a stone gable, with a bell hung in the arch beneath. Over the bell there is a monogram and date, the inscription being cut on a band beneath the bell. The matchboarding on walls is 4ft. high, the walls above boarding being finished in fine stucco; the roofs are plastered between the rafters, the whole of the timbers being wrought and varnished. The windows are glazed with plate glass, and water-tight pivot ventilators in the upper lights. Good ventilation is provided throughout the whole of the rooms. Each room is lighted at night by gas coronas; the

rooms are warmed by Gill stoves set in arched recesses. The rooms are well fitted up with book-cases. There are proper out door offices, and spacious, well-laid-out playgrounds, separated by walls and palisades. The whole of the works have been well executed by the following local tradesmen:—Mason, J. Williams; carpenter and joiner, T. R. Miles; plasterer, G. Hardy; painter, G. Norton; smith, G. Williams; carver, W. Muller-white; from designs by, and under the superintendence of, Mr. A. Harrisson, architect and surveyor.

TORQUAY.—A new school building recently erected in Higher Union-street, immediately above Upton Church, was opened on Monday, July 31st. The site is the gift of Sir Lawrence Palk, M.P., the lord of the manor. The style adopted is Gothic, of the Early English period, and contrasts favourably with a dispensary in the Tudor style on the one hand, and Upton Church, a plain but pleasing Early English structure (designed by Salvin), on the other. The ground-floor contains a boys' school-room, 53ft. by 20ft.; a girls' room of similar dimensions; a school-room for infants, 42ft. by 20ft.; a large class-room, and offices. Accommodation for the master, and a room for a night school, are provided in the basement. Light, space, and ventilation have received especial attention. The roof-timbers are visible, and, together with all other internal wood-work, stained and varnished. Accommodation, 300. Cost, £1,850. Architect, Mr. J. W. Rowsell, Torquay and Newton Abbot. Clerk of works, Mr. E. Richards. Contractor, Mr. W. Eddles, of S. Mary Church.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

JOHN WESLOCK.—Perhaps other subscribers would object to such a supplement.

BRADY AND SMILES.—The drawing to hand.

RECEIVED.—John Kemp, Jas. Blackney, J. McClelland & Son, W. & S. F. Goddard, H. G., J. Bladen.

Correspondence.

THE PROFESSION.

To the Editor of the BUILDING NEWS.

SIR,—A correspondent "Jay," in your last week's issue, remarking on the overcrowded state of the profession, suggests that it may be owing to the parsimony of some of our architects in having inferior draughtsmen and a large number of pupils. As for example: An architect of my acquaintance has for his office staff five pupils and but two paid assistants, the one a surveyor and the other a draughtsman.

I may add that the gentleman cited is not an art-architect, and does little or no drawing himself, his time being fully occupied in talking to clients and looking after work. "The unprecedented opportunities for improvement" his pupils enjoy are obvious.

A writer in your excellent journal some time ago, very pertinently but facetiously asks, "If three parts of sand go to one of good stone lime, what proportion of pupils to draughtsmen may a practitioner fairly and honourably adopt?" Is the ratio instanced above, and which I do not think uncommon, a proper one? The solution I leave with your readers.—I am, &c., H. L.

SIR,—I am always pleased to see a "revived agitation" relative to the present unsatisfactory state of the profession, and also suggestions for the correction of evils which are considered detrimental to its advancement. A "revived agitation" I say, because I notice a letter in your last week's issue, which treats of this painful question; and which induces me to add a few further observations to those advanced by "Jay." It is, I think, pretty generally admitted, and too well known by many junior members of the profession, that the wholesale "pupil-taking system" is one which produces the most lamentable consequences to its health and prosperity, and it would be entirely useless to reopen a subject which has already been so freely discussed through the medium of your correspondence

columns, from time to time. Being content, then, to merely mention the broad fact, I will pass on to notice what the writer says regarding the "stinginess" of many architects, in being content to employ inefficient draughtsmen at low salaries, instead of giving preference to more efficient men of better worth. This is undoubtedly true to some extent, but I cannot but think that many architects act doubly dishonourably, in not only taking pupils from a decidedly lucrative, and selfish point of view; but also in so coolly dispensing with them without even giving them the option of remaining after their articles have expired. They seem to think, forsooth, that after their pupils have enjoyed the valuable privilege of being in their office for four years, thus gaining such a superlative amount of information, and such high accomplishment in the profession, and that by merely cancelling their articles in a formal manner, and supplying them with a testimonial of some sort, their duty is ended, and honour perfectly maintained. But it is easy to discover the fatal tendency of this disreputable practice, for it must of necessity throw many on the stream, to hope for employment only from more honourable men, whose practices do more to adorn the profession with which they are identified. And then, again, interwoven with this evil, is another upon which I should like to say a few words, and it is with regard to the patronage and encouragement which members educated to the profession receive. Let it not be understood that I would exclude talent, from whatever source it may flow; but I would certainly rather choose it from the ranks of an art education than outside that pale. The reason for such a selection must be obvious. But it seems to me that what we most want is a more thorough and practical architectural training—one indeed, which would show itself more worthy of the day in which we study. This must, and can only be realised by the honest and zealous co-operation of master and pupil; both must alike be striving towards one object, and that object in common to both, the one willing to teach, and the other anxious and in earnest to learn. Surely, sir, if we could witness such a harmonious working as this going on throughout the ranks of the profession, we should speedily have the felicity of discovering a happier and healthier state of things. Much has been said, and on very good grounds, about setting the architect on a parallel footing with other professional men, by making his profession more strictly worthy of the distinction, and I, for one, do not really see why the "Voluntary Architectural Examination" should not be made a "compulsory architectural examination," and thus effect, at any rate, not only the desired object of making it more select, but also of raising it to a higher perfection of competency, as I think we have good grounds for hoping. Apologising for thus trespassing on your space, I am, &c., J. C.

SIR,—I observe by your impression of last week that another champion of the "injured pupil" class ("Jay") has entered the lists, and commences his tilting with: "My theory is that the stinginess of some of our architects has very much to do with it." Now, sir, my theory is that the majority of pupils have no real artistic feeling, and consequently are totally unfitted for the profession; and in the few isolated cases where talent does exist, too many of its possessors fritter away their time by beginning at the wrong end, such as sketching the exteriors of cathedrals and other elaborate works, without the slightest regard to detail, and not paying that careful attention which they should do to the true practical (and at first simple) work which is allotted to them when their articles are commenced; but this class of work, this proper beginning, is by the cathedral sketcher at once voted a bore. What is the consequence? The articles expire, and the now "assistant" finds himself looked upon as "a very decent fellow at sketching," but one without a grain of practice in him. I have been sixteen years in the profession, and never knew a competent man fail to occupy a good position.

Because architects refuse to employ these sketchers, dreamers, and prize-men of South Kensington, or give them no more than they are worth, they are, forsooth, accused of "stinginess!"

Fare thee well, "Jay"; chatter no more on this subject, my bird.—I am, &c., SET SQUARE.

August 15, 1871.

SELENITIC MORTAR.

SIR,—The basis of my remarks on the selenitic mortar was the circumstance of not only the hardening of ordinary mortar being ascribed to the action of carbonic acid, but that of plaster of Paris also. In the first case the acid is derived from the

atmosphere, and the hardening is of slow accomplishment. In the second it is naturally in union with the material, and the setting is immediate. French plaster of Paris contains about 12 per cent. of carbonate of lime, and it is found that the purest plasters are those which harden least.

P. E. M.

HOUSE CISTERNS.

SIR,—In his admiration for his own invention "Plumber" blindly abuses my suggestion of the syphon. His objections are unteachable. I should have the standing waste, of course, the same height as usual, and the syphon trap must necessarily work properly. A late account of a large waste-pipe in a new mansion being untrapped at all shows how indifferent mechanics are to the necessity of stopping foul air, and the need of architects and householders looking to such things. "Plumber," of course, sees no necessity for doing away with cisterns. It is, however, a consummation devoutly to be wished, when, as at the present time, we await a visitation of cholera. Abolish the fever and cholera-engendering cisterns of the upper classes, and the still worse filthy water receptacles of the poor (affording them a miserably insufficient supply), and substitute direct service and unlimited quantity, and the death rate must go down many degrees—to say nothing of increased comfort and morality.—I am, &c.

M.

THE EXPLOSION OF POWDER MILLS.

SIR,—Though the real origin of the explosion of our powder mills can never be exactly ascertained, it is well known that it invariably takes place at or about the corning house. Now the means of rendering such explosions almost impossible have been known time out of mind, and commonly used for various purposes. The paste for ordinary powder is always ground in the wet state, when no explosion is to be feared. But when this wet paste is submitted to enormous hydraulic pressure in cakes 6in. by 3in., and perhaps 3in. in thickness, until it becomes dry and hard, then the first period of danger is reached, for it may be that, during this change from wet to dry under extreme pressure, spontaneous explosion may possibly occur.

The following operations of breaking up and corning are the second source of danger, both of which may be readily avoided by passing the still wet paste through an hydraulic cylinder, provided with a strong metal bottom, pierced with numerous holes of suitable diameter, and carrying a central revolving knife to cut off grains of proper length, precisely in the same manner that seed "macaroni" has been produced for centuries past.

The corned powder, still damp, which has already undergone severe pressure, may now be received upon endless webs, and conveyed by means of slow revolving cylindrical sieves or otherwise through a drying tunnel of sufficient length to deliver the finished powder at the further end hard and dry, and fit for immediate packing.

The tunnel may be kept constantly in a dry state by simply forcing a strong current of air, warmed or otherwise, through it from end to end.

There is, however, but little chance of such a simple and perfect process being carried out unless it could be subjected to the Patent Laws, which might, perhaps, be possible by some legal fiction as most patents are.—I am, &c., C. E.

SOMERSET HOUSE AND THE THAMES EMBANKMENT.

SIR,—The terrace to the river front of Somerset House has been considered by those competent to judge an admirable piece of architectural composition, and the opening of the Thames Embankment has given an opportunity that did not before exist, for viewing its excellent detail and proportion. The authorities at Her Majesty's Office of Works have considered it necessary, and no doubt they are correct, that this terrace front should be enclosed by a balustrade. The balustrade is of stone, and in itself presents little for either condemnation or commendation, but the manner in which its relation to the existing building has not been considered would afford an opportunity for those who desire to be funny or facetious to indulge somewhat in the exhibition of those qualities.

At the two gateways of the terrace on each side, are coupled columns with plinths and bases that were formerly exposed to view, and whether or not the artistic authorities at the said office considered these bases objectionable, we are not in a position to say; but it is certain that they have continued the new balustrade in one straight line for the whole length of the front. The consequence is that the

plinths, the bases, and part of the shafts of these columns are hidden from view, with a most damaging effect to the architecture. This manner of procedure displays, in my opinion, great want of consideration and thought, and no regard for making the new work a creditable addition to the old. Had such a desire existed, the piers of the new balustrade would have been stopped in each case at the outer angle of the plinths of the existing columns. The whole of them would then have been visible from the Embankment, the balustrade could have been treated picturesquely, and an addition of one would not have been added to the list of public buildings damaged architecturally through the negligence of those having control over them.

Unfortunately, these errors repeat themselves. They are not confined to one building, for if it were required, how sad a proof of incompetence and utter disregard of detail and general effect by those under whose control our public works are placed, and how inconsiderately they deal with the buildings under their charge, is shown by the hideous attic lately erected over the central hall of the General Post Office, St. Martin's-le-Grand. It is lamentable that on the first opportunity occurring for making additions or alterations to our public buildings, such should be taken advantage of for exhibiting that culpable ignorance that results in the spoliation of them.—I am, &c.

W. W.

Intercommunication.

QUESTIONS.

[2284].—**Asphalte for Footpaths.**—Would some reader kindly inform me the ingredients, and the proportions in which same are used, in making asphalte, as used on footpaths, &c.? Also, the best method of mixing and laying same, and oblige—G. P. B.

[2285].—**An Inquiry.**—I have recently noticed, in several small churches in Wales, a feature which I should be much obliged if any reader would explain to me. In the side wall of the nave (there being no aisles), about 20ft. from the chancel-arch, there is a small archway leading to a flight of steps which go up in the thickness of the wall, towards the chancel, to another small archway, opening into the church about 12ft. above the ground-floor. There is no gallery running round the church, but only this archway at the top of the steps.—KEN.

[2286].—**Portable Photographic Apparatus.**—Will some "Intercommunicator" oblige another by telling him where may be obtained those small portable photographic apparatus (on the dry-plate system) used by field naturalists and others, and whether they are suitable for taking architectural detail, such as elaborate carving, &c.?—W. L. S.

[2287].—**Ice-Well.**—Will some reader kindly give me a few hints on the construction of an ice-well? What are the points particularly to be noticed, and about the cost of one of ordinary size?—W. R.

REPLIES.

[2280].—**Iron Beam.**—The beam shown in the drawing by "M. A. B." is one of a section no longer used. It is of the single-flange type, introduced many years ago by Tredgold, but now altogether discarded for the section with double flanges, known as Hodgkinson's beam. But, nevertheless, the strength of the single-flange beam may be easily calculated from the formula—

$$W = \frac{A \times D \times C}{L}$$

in which A = the area of the flange in square inches; D, the depth; L, the length of the beam; and C, a constant, which may be taken equal to 60. The value of W will be the breaking weight, in tons, at the centre, on the supposition that the beam is horizontal, which, for all practical purposes, will answer for any small elevation of one of the supported ends above the level of the other.—J. L. P.

[2281].—**Taking Out Quantities and Measuring-up Work.**—"Inquirer" should get "The Young Surveyor's Preceptor," by John Reid, surveyor.—S. W.

[2281].—**Taking Out Quantities and Measuring-up Work.**—"Inquirer" will find all the information he wants in "The Student's Guide to the Practice of Measuring and Valuing Artificers' Works" (by Dobson & Tarn), published by Lockwood & Co., London. There is no better book for the purpose.—CLERK OF WORKS.

[2281].—**Taking Out Quantities and Measuring-up Work.**—Reid's "Young Surveyor's Preceptor" is one of the best.—F.

[2282].—**Colours Used in Drawing.**—Payne's gray for the former, and gamboge for the latter.—F.

[2283].—**Priming.**—Unless stated separately, the priming would be regarded as one of the coats. When "flattening" is specified for, it is always mentioned separately—thus, 3.0.F would mean three times in oil and flattened.—P. T. S.

[2283].—**Priming.**—Reckon priming as one coat.—F.

LEGAL INTELLIGENCE.

ALLEGED MANUFACTURING NUISANCE.—Mr. W. Q. Callender, the manager of the Val de Travers Asphalt Paving Company, appeared last week to an adjourned summons, at the instance of the Greenwich District Board of Works, charging him with carrying on the business of the company on a piece of land between the River Ravensbourne and Deptford-bridge, so as to be a nuisance and dangerous to the health of the inhabitants, as certified by the district medical officer. The evidence taken showed that in the month of May last the company took possession of a piece of land at Deptford, about 150ft. by 200ft., for the purpose of carrying on the business of manufacturing asphalt paving. Three sides of the land are surrounded by dwelling-houses, occupied by tradesmen and artisans, the other side being open to the River Ravensbourne, about 25ft. wide, but also having dwelling-houses adjacent. On this land, wholly uncovered, there had been the manufacturing of the asphalt material in eleven open cauldrons, each from 10ft. to 12ft. in length and 6ft. in width; and also two fixed cauldrons in brickwork, connected with which is a shaft chimney, but being of a less height than the surrounding inhabited houses. These cauldrons were heated by coal in open fireplaces, and large quantities of thick white vapour or steam were frequently given off of a very offensive character, and being described as perceptible among a dense population contained in an area of one-eighth of a mile. The district board had been memorialised by the inhabitants, and Mr. Pink, the district medical officer, had certified as to the manufacture being carried on in such a manner as not only to be a nuisance, but injurious to the public health; and Dr. Parker, a medical gentleman practising at Deptford, now gave evidence that he was in the habit of visiting patients within the area several times in the day, and that the extraordinary odour given off from the works caused the closing of doors and windows of houses by the inhabitants. The effect of the nuisance was to cause nausea and sickness upon the strong and healthy, and upon the weakly irritation and coughing. In two cases in particular, in which ventilation was of the greatest importance, where one patient was affected with inflammation of the lungs and bronchitis, and the other with rheumatic fever and heart disease, the injurious effects arising from the nuisance retarded their recovery; and the treatment usually prescribed was of no avail. The nuisance he described as being intolerable and perfectly suffocating; and he believed it injurious to the vital energies and appetites of the immediate residents, rendering them more liable than others to attacks of cholera or any other epidemic. In confirmation of this state of things about a dozen witnesses were called, some of whose wives and children and servants had been rendered ill since the works had been in operation, and who, in cross-examination, said that although a promise had been made that day week, on the adjournment of the summons, that the nuisance should not be continued, it had existed in its entirety until the previous evening, and that it still continued to exist. After a great deal of legal argument between the learned counsel, Mr. Poland, on behalf of the defence, said the fact was that the company was compelled to complete contracts which had been entered into within a prescribed time under heavy penalties, and instead of the manufacture taking place in Switzerland the land at Deptford had been taken. The whole of the open cauldrons had, however, that morning been removed, and would not be again used, but as it was necessary to complete the work in hand, he promised, if the proceedings were stayed until Wednesday, the 23rd inst., that only the two closed fixed cauldrons should be used, and that the district medical officer, the inspector of nuisances, and another person should have permission to visit the works, and if at the end of that time there should exist any well-founded complaint the company would abolish the works altogether. This course was acceded to, and the summons accordingly adjourned.

TRANSPERENCE OF A CONTRACT.—**VINCENT v. CAMPBELL.**—This was an action (brought last week in the Lord Mayor's Court) to recover £72 15s. 4d. for work done and goods supplied by the plaintiffs to the defendant. Mr. Talfourd Salter appeared for the plaintiffs, and Mr. Shaw for the defendant. The plaintiffs, Messrs. Willett and Vincent, carry on business as gas-fitters and engineers under the name of Deane and Co., in Arthur-street, London-bridge, and it appears that a Mr. Harding, of Nicholas-lane, was employed by the defendant to execute certain work at the International Club, in George-street, Hanover-square, of which defendant was proprietor. Mr. Harding transferred the job to the plaintiffs, who carried out the necessary work required to be done, with the consent and knowledge of the defendant. The question now at issue was whether Mr. Harding was not responsible to the plaintiffs, but inasmuch as the defendant knew that the former had turned over the contract to the plaintiffs, the defendant not objecting, he was clearly liable. When Captain Campbell was asked for payment he promised it, and offered the plaintiffs a bill for the amount at three months, but they declined to accept

it. The defendant said that he refused to pay the bill when it was presented to him on the ground that he feared Mr. Harding would charge him with items which appeared in the plaintiffs' account. Moreover, some of the work which they charged for had been already paid for, and he did not think he could be held liable. The jury found a verdict for the plaintiffs.

IN RE H. A. HOLDEN.—The case of Howard Ashton Holden, contractor, of Ethelburga House, Bishopsgate-street, came before the Court of Bankruptcy last week. Mr. Treherne applied, on behalf of the petitioning creditor, that the bankruptcy proceedings, which had been stayed pending the proceedings for liquidation which had been instituted, should be continued. A composition of 2s. in the pound, unsecured, had been accepted, but at a previous meeting proofs for £16,500 had been disallowed, and consequently the resolutions could not be registered. His Honour said that upon the production of the Registrar's certificate that the liquidation had fallen through, directions would be given to prosecute the bankruptcy.

COMPENSATION CASES.

ALLEN v. NORTH LONDON RAILWAY COMPANY.—This was a compensation case (tried last week at the Sheriff's Court, Red Lion-square, before Mr. Under-Sheriff Burchell and a special jury) to assess the amount to be awarded for premises in Cumberland-place, Shoreditch, required by the railway company. Mr. M. Chambers, Q.C., and Mr. Paget were for the claimant, and Mr. Lloyd for the company. The plaintiff is an extensive splint maker, and supplies large quantities of splints to Messrs. Bryant & May. By machinery he made thousands of splints per day, and had been obliged to take other premises at Old Ford, because the railway company required some portion of his premises, and he asked for compensation for the damage caused by the severance. No damage was asked for the loss of trade. Evidence was given by surveyors in support of the claim, and no witnesses were called for the company. The jury assessed the compensation for the premises at £1,218, and £246 for the severance; total, £1,464.

THE CARPENTERS' COMPANY v. THE GREAT EASTERN RAILWAY COMPANY.—This action (tried last week at the Sheriff's Court, Red Lion-square, before Mr. Under-Sheriff Burchell and a special jury) was brought to ascertain the value of some property in Norton Folgate, bequeathed to the Carpenters' Company for charitable purposes, and now required by the Great Eastern Railway Company for the extension of their line to Liverpool-street. The evidence of the surveyors called by both sides was very conflicting, and the jury had to decide between the parties. The jury awarded £5,400. Mr. Lloyd and Mr. Day were for the claimants; Mr. Hawkins, Q.C., and Mr. Marriott for the railway company.

WATER SUPPLY AND SANITARY MATTERS.

THE DRAINAGE QUESTION AT RICHMOND.—At a meeting of the Richmond select vestry recently, Mr. J. Maxwell brought forward a motion to dissolve the sewage committee, as a preliminary measure to inducing the co-operation of all the towns and parishes now polluting the river with their sewage in an appeal to Government for a comprehensive scheme of drainage for the entire valley of the Thames. It was generally admitted that Richmond was receiving the sewage of London, and that any efforts made by Richmond alone towards the purification of the river would be unsuccessful; and yet Mr. Maxwell's motion was lost by 12 to 7. The reporter, who had not received permission to attend the meeting, was requested to withdraw, on the ground that he had not applied through the usual channel for authority to do so, and this incident gave rise to a protest on the part of several members. Mr. Maxwell among the number, who moved that all meetings of the vestry members of the press be admitted. The majority, however, were in favour of gagging the press.

CONDITION OF NORTH WOOLWICH.—Mr. Harrison, C.E., concluded, on Tuesday, an inquiry which he has been directed by the Home Secretary to make concerning the sanitary condition of the district known as North Woolwich, comprising parts of the parishes of Woolwich and East Ham. Major Stewart, Chairman of the Dagenham Commissioners of Sewers, said their complaint was confined to East Ham, where the marsh ditches were polluted by house drainage, and rendered unfit for the cattle to drink; but Mr. W. P. Jackson, Chairman of the Woolwich Local Board, strongly urged the extension of the inquiry to that parish, so far as it existed on the northern side of the river, saying that though the ratepayers had paid drainage rates for fifteen years, the Metropolitan Board had shirked the duty cast upon it of intercepting the local drainage. The consequence was that it was carried by the local sewers into the River Thames at every tide, and was ponded up in the sewers under the houses every day, frequently overflowing into the cellars and streets. Other evidence showed that there was no provision

whatever for drainage in East Ham, which is just outside the metropolitan boundary, and that the sewage spread in stagnant pools over the land adjacent, except where it was carried by open troughs into the ditches. Mr. Hudson, representative of Woolwich at the Metropolitan Board, said that the Board was quite aware of its responsibility to drain North Woolwich, but as it was 8ft. below high-water mark the expense would be enormous, something like £50,000, and £500 a year for a pumping station. The Board was prepared to consider a scheme for the combined drainage of the whole district, if Silvertown and East Ham could be included. Dr. Vance, Poor-law medical officer, said that scarcely any one residing in the district was in good health, the prominent complaints being enlarged liver and spleen, St. Vitus's dance, and fevers. He had traced to this district recent epidemics of scarlet fever, which had spread throughout London, and the poisonous gases arising from the marsh ditches were the constant source of sickness. Mr. McDowell, relieving officer and registrar, said, on the contrary, that the death returns showed a state of health superior to that of Scarborough, Leamington, Cheltenham, Windsor, and other salubrious places; but Dr. Vance said that was because the people were all sent away from North Woolwich to die. Mr. Harrison said he had seen for himself that the district was in a most foul condition, which required an immediate remedy, without waiting for the Metropolitan Board to propound a scheme. He should make his report to the Home Office, and the result would probably be an order upon the proper authorities to carry out certain works of drainage forthwith.

THE LIVERPOOL SEWERS.—Commenting on the high death-rate of Liverpool, Messrs. Reade and Goodison remark in a letter to a local contemporary on the strangeness of the fact that so few practical suggestions have been made for the improvement of the defective sewerage system of the town. In the early stages of sanitary work it was thought only necessary to construct sewers of a capacity sufficient to enable them to be entered and cleaned; thus recognising their semi-cesspool character. Afterwards it was thought possible to make them self-cleansing; and it is probably on this supposition that the sewerage of Liverpool has attained its present form. Experience has, however, shown that this is impossible. Even with the best constructed sewers, with the smoothest inverts and quickest gradients, deposits of flocculent matter take place, which can only be remedied by frequent flushing; and, in sewers of sluggish flow, more solid deposits of road detritus, mixed with organic matters—fat, soap, vegetable matter, &c.—occur. Under the present system these pestiferous products are generally left fermenting in the sewers until an interruption of the flow gives warning that all is not right, when a crane and bucket make an appearance to block up the streets, the cumbersome flags are removed from the hermetically-sealed manholes, and the cleansing begins. Messrs. Reade and Goodison think flushing gates were built in the manholes at intervals in the brick sewers in Liverpool, which might readily be done—hung so as to open against the pressure of the water—with circular sluice valves for flushing contained in the gates at the level of the invert, of a size to be readily opened; and were circular flushing valves the size of the pipe sewers also provided, and together with these several gangs of men with inspectors whose duty it would be to attend to the cleansing of the sewers, we should bear no more of deposits in the Liverpool sewers.

STATUES, MEMORIALS, &c.

SCOTTISH NATIONAL PRINCE CONSORT MEMORIAL.—It is now finally settled to place the Scottish National Memorial to the Prince Consort in the centre of Charlotte-square. The proprietors have unanimously put the square at the disposal of Her Majesty, and the committee, through their chairman, the Duke of Buccleuch, brought this under the notice of the Queen when proposing and earnestly recommending this site. The work is entrusted to Mr. Steel.

STATUE TO SIR JAMES OUTRAM.—The statue of Sir James Outram, which has been erected on the Thames Embankment, opposite Whitehall-place, was unveiled yesterday at one o'clock, Lord Halifax presiding.

STATUE OF OLIVER CROMWELL.—On Saturday week a model of a statue, to be erected to the memory of Oliver Cromwell, was placed *pro tem.* in Parliament-square, Palace-yard, immediately opposite the principal entrance to the House of Commons. The statue, when executed, will be eight feet in height, and promises to be a fine work of art.

There was a discharge of joiners from Chatham Dockyard on Saturday, in consequence of there being no further need for their services at present. During the week a number of painters were also discharged from the same cause.

The Olio is the title of a new penny weekly journal devoted to music and the drama. The first number has just appeared.

Our Office Table.

THE RATING OF GOVERNMENT PROPERTY.—This question, says *Hornor's Monthly Circular*, has recently formed the subject of Parliamentary debate, and attracted the attention of many people to whom the subject is to a large extent new. Why should the buildings which form the Government depôts, and are therefore supported and paid for by the whole nation, be rated to the relief of the poor? It is a good and a safe principle that the individual occupier of a house should be rated to parochial burdens, but in the instance of Government buildings it is a very different thing. By rating Government property, which employs labour, the country simply pays to the local interest of a few neighbourhoods. If the Government buildings be rated to the poor rate, it must figure somewhere or another in the estimates which the Chancellor of the Exchequer has to frame, consequently until the whole of England comes under a comprehensive and general rating, to charge buildings can only cause disputes and ill-feeling, as in many cases the Government buildings may be in one parish and the workpeople in another, and thus the parish receiving benefit would not have to pay to support the labour when unemployed.

OXY-HYDROGEN GAS LIGHTS.—A company is being formed for the purpose of lighting the cities and towns of the United Kingdom with the application of oxygen gas, as a considerable portion of New York has been for some time, and as Paris, Vienna, and Brussels are about to be. When common highly-carburetted hydrogen is properly burnt with oxygen it gives a white light so pure that it may be seen for twenty or thirty miles; and by supplying this sustainer of combustion direct to the flame, the present vitiation of the air will be entirely done away with. The value and importance of oxygen is, indeed, generally known, but hitherto the cost has been prohibitory. The promoters of the company are in possession of a discovery by which oxygen can be obtained at one-third the expense of ordinary coal gas, and a complete and very desirable revolution is on the verge of being made in the illumination of our streets and houses. The parties connected with the movement are said to be substantial, and the capital to be subscribed one million.

WORKING MEN'S VISIT TO S. PAUL'S.—About 60 members of S. Augustine's Working Men's Club, Haggerston, have paid a second visit to S. Paul's Cathedral, by the kind invitation of Canon Liddon, who spent three hours in conducting the party over the building. From the crypt below to the galleries above, including every monument of any interest, all was explained in the most kindly and painstaking way. At the annual meeting, held on Monday last, in S. Augustine's School-rooms, under the presidency of Mr. Richard Foster, it was decided to subscribe one guinea out of the balance in the treasurer's hands towards the Cathedral Restoration Fund, as some small but practical recognition of the kindness of Canon Liddon. The vote having been carried by acclamation, received an additional impulse by a donation of £5 from Mr. Foster.

FIREPROOFING SHINGLE ROOFS.—A wash composed of lime, salt, and fine sand or wood-ashes, put on in the ordinary way of whitewash, according to an American journal, renders a shingle roof fifty-fold more safe against fire from falling cinders, in case of fire in the vicinity. It pays the expenses a hundred-fold in its preserving influence against the effect of the weather; the older and more weather-beaten the shingles, the more benefit derived. Such shingles are generally more or less warped, rough, and cracked. The application of wash, by wetting the upper surface, restores them to their original or first form, thereby closing the space between the shingles; and the lime and sand, by filling up the cracks, prevents it warping. By the addition of a small quantity of lampblack, the wash may be made of the same colour as old shingles, and thus the offensive glare of a whitewashed roof may be avoided.

SUBURBAN HOUSES.—Our vast and seemingly never-ending suburban districts would present a very different and more pleasant appearance, says a local journal, if the residents therein were in the slightest degree horticulturally-disposed, and would commence planting trees and cultivating vines and "creepers." If the fronts of the houses were not gracefully covered and made pleasant to the eye, the backs (now so grievously monotonous, dreary, and unsightly) might be made green and cheerful. A little attention to this matter would transform our interminable mass of brickwork, in all directions, into a succession of productive vines and verdant climbing plants, and would much conduce to suburban comfort, for in our suburbs we have too much

of the dreariness of rural life, with too little of its enjoyments.

THE NEW INDIAN CIVIL ENGINEERING COLLEGE.—The *Spectator*, in chronicling the opening of this college, to which our first leading article was devoted last week, says that the Duke of Argyll "made a forcible but rather indiscreet speech, condemning English engineers for their want of scientific training, and evidently anticipating better-trained men from his college than from the great engineering establishments." Our contemporary does not share this anticipation, though it approves the college. "It will not give us abler men. It will not give us such rough-and-ready men. But it will give us men whose glory will be economy, and not expense, who will look to the State, and not to the profession, for reputation and honours; and who will regard the Government as their friend and ally, instead of their enemy. The last is a very dangerous feeling, entertained by all the semi-organised services in India, and very nearly incurable. It is the jealousy which English soldiers and sailors show of civilian orders, exhibited on a larger field and in a less restrained way."

BUXTON.—The new pleasure grounds, &c., were opened on Thursday last by his Grace the Duke of Devonshire, K.G. The grounds, which for many years past have been known as the Serpentine Walks, have been so altered and improved that those who visited Buxton would scarcely be able to recognise the old walks. The gardens, as they are now called, are in the centre of the town, and have been laid out on lands presented to the Buxton Improvement Company by the Duke of Devonshire, who has also contributed in a very liberal manner to the capital of the company. On the north side of the grounds a spacious pavilion has been erected. It is 400ft. long, and contains a central hall for concerts and assemblies. The central hall is flanked by two conservatories, with waiting-rooms, &c. From a terrace running the whole length of the pavilion the ground slopes beautifully down to the river Wye, which is crossed by a handsome cast-iron bridge, over which the principal walk passes from the centre of the terrace to the band-stands, from whence the walks diverge in various directions, affording both pleasant lounges, shady spots, and charming views of the surrounding scenery, while the great natural advantages of the grounds have been carefully and most artistically utilised. The works were commenced in August last year, since which time the large pavilion already mentioned, two miles of walks and five bridges have been constructed. The two lakes, which will be remembered by visitors to Buxton, have been joined, two new waterfalls have been made, and the grounds have been thickly and artistically planted with evergreens and trees. Statuary also is not wanting. The pavilion is built of iron and glass, with a stone base. It is lighted with gas, and provision is made for warming it by means of four rows of hot-water pipes running all round the building. The structure is of course quite modern in style. The pavilion and the grounds have been designed and superintended to completion by Mr. Edward Milner, the eminent garden architect, of London; the contractors were Messrs. Wade, of Manchester; and Mr. J. Martin was the foreman of the works. The total cost was £12,000.

THE THAMES EMBANKMENT.—The select committee of the House of Commons on the Thames Embankment met on Wednesday week to consider their report. The conclusion arrived at by a considerable majority, in spite of the opposition of the Chancellor of the Exchequer and the Attorney-General, supported by Mr. Laird and Mr. Anderson, is favourable to the claims of the public. On the motion of Mr. W. H. Smith a resolution was passed recommending that the greater part of the land in dispute, about two acres in extent, should be set apart as a public garden, to be held from the Office of Woods, under a lease of 31 years by the Metropolitan Board of Works, at a rental on the same scale as that paid by the Duke of Buccleuch and other lessees of Crown property. To the Crown itself is reserved for building purposes the line of land continuous with the houses in Whitehall-gardens. The committee asks the Government to take the necessary steps to give effect to this resolution.

CLOSE DAYS AT THE NATIONAL GALLERY.—A curious circumstance is pointed out by the *Globe* in connection with our two permanent picture galleries, located at South Kensington and Trafalgar-square. The latter, which is the National Gallery of England, while it is rich in examples of the early Italian School, and, by its recent acquisitions, in the Dutch School, illustrates very feebly our own English masters. Morland, Wilson, Lawrence, Landseer are scarcely represented at all, and the splendid collec-

tion of Turner's landscapes is attributable entirely to the public spirit and eccentricity of that artist. At South Kensington, on the other hand, the exhibition may be said to be fairly represented. Three days of the week are reserved for the students; but even then a trifling admission charge which keeps away idlers allows access to those who desire to visit the galleries. This arrangement has been continued for years and been attended with no ill results, and the authorities find that the admission of a few spectators is quite consistent with the conditions of study which prevail in the building upon business days. The arrangements at Trafalgar-square are very different; there, too, a couple of days in the week are devoted to the Academy students, but on those days admission to strangers under any circumstances is rigorously refused. Visitors to London who have come from the provinces, and may have only Thursday or Friday to devote to the picture gallery of the nation, will find that neither payment nor entreaty can gain them admission to see those seventy splendid pictures for which the taxes where-to they contribute have been placed under requisition for as many thousands of pounds.

STAINED GLASS.

REDENHALL.—A stained glass window has recently been placed in the south aisle of the parish church, Redenhall, Norfolk, to the memory of the late Mrs. Ormerod, wife of the rector, the Ven. Archdeacon Ormerod, at the cost of her six children. The window has three lights, representing the Resurrection. The central light contains a figure of the Saviour, beneath which is the sitting figure of the angel who watched by the tomb. In one of the side-lights are represented the three women who went early to the sepulchre on the morning of the Resurrection, and in the third light appear S. Peter and S. John. Below the figures are inscriptions, and each of the side-lights has in its upper compartment an angel bearing an inscribed scroll. The top of the entire window is filled with the family arms. The window was executed by Messrs. Heaton, Butler, & Bayne, of Garrick-street, Covent-garden. The same firm have in hand a memorial brass for the recess beneath the window described.

Chips.

The last of the Metropolitan turnpike gates (Swiss Cottage, Finchley-road) has just been removed.

At Southampton, a tramway between the railway station and the Royal Pier is in course of construction, and will shortly be ready for use.

The National Schools at Little Bardfield, Essex, are being enlarged by the addition of a new wing. Mr. C. Rolfe is the architect.

The chancel of Southend parish church is to be enlarged, at a cost of £450.

Prittlewell Church, near Southend, is now in course of restoration, under the direction of Mr. Ewan Christian, the architect to the Ecclesiastical Commissioners.

Timber Trade Review.

Prices, August 15, per Petersburg standard: Archangel best yellow, £12 10s. to £14 10s.; ditto second yellow, £9 10s. to £10; Petersburg best yellow, £13 to £13 10s.; Wyburg best yellow, £9 10s. to £10 10s.; Finland and handsawn Swedish, £7 to £8; Christiana deals, best sorts, yellow and white, £12 to £12 10s.; Norway deals, other sorts, £12 to £12 10s.; Norway deals, other sorts, £7 to £8; Norway battens, all sorts, £5 15s. to £7; Swedish and Gettenburgh, good stocks, £12 to £12 10s.; common and thirds, £8 10s. to £9 10s.; Gelfe and best Swedish deals, £11 10s. to £12 10s.; Swedish battens, £8 10s. to £9 10s.; Quebec pine, first quality floated, £16 10s. to £18; second floated, £12 10s. to £13; third floated, £8 10s. to £9; Quebec, first quality bright, £18 to £19 10s.; ditto, second quality bright, £13 5s. to £13 10s.; ditto, third quality bright, £8 15s. to £9 5s.; New Brunswick mixed pine, £7 to £8; Canadian first spruce, £9 10s. to £11; seconds, £8 10s. to £9 5s.; thirds, £7 15s. to £8 5s.

Trade News.

WAGES MOVEMENT.

LEEDS.—At a meeting of the operative brickmakers of Leeds, on Friday last, attended by about 150 men, a resolution was passed to the effect that a fortnight's notice be given to the masters for nine hours a day as the period of labour at 7d. per hour, and that at the end of six months the remuneration be 7½d. per hour.

SHEFFIELD.—On Friday last a crowded meeting of operative carpenters and joiners was held in the

Temperance Hall, Sheffield, to take into consideration the desirability of obtaining a proper code of working rules from the masters' association. Great discontent was expressed at the present state of affairs, and a resolution was passed that notice should be given to masters for obtaining a code, and also for the nine hours' system. A portion of the meeting desired the notice to be given at once, but it was ultimately decided that it should be postponed until next spring at the latest.

TERMINATION OF A STRIKE.—At a numerously-attended meeting of the miners of the east of Fife held on Wednesday week at the Caves of Wemyss, it was reported that several of the Murridge miners out on strike for an advance of wages have returned to work, thus breaking faith with their fellow workmen. On the recommendation of the secretary of the Miners' Association for Scotland, it was agreed that the rest of the workmen should resume work; also that an effort should be made with a view of publicly prosecuting "blacklegs" for obtaining money from the union on false pretences.

TENDERS.

CHEADLE.—For residence, with stabling, conservatory, &c., for J. H. Deakin, Esq., at Cheadle, Cheshire. Mr. James Bayley, architect. Quantities supplied:—

Barber & Gibson (accepted) £2689 1 10

FUNDENHALL.—For a residence at Fundenhall, Norfolk. Mr. R. M. Phipson, F.S.A., architect:—

Hales (accepted) £555

GARBOLDISHAM.—For schools and school-house, Garboldisham, Norfolk. Mr. R. M. Phipson, F.S.A., architect:—

Bishop (accepted) £825

HASTINGS.—For block of dwellings, in flats, of fire-proof construction, proposed to be erected at Hastings. Mr. G. Friend, architect, Maidstone:—

Skinner	£3749 0 0
Howell	3669 0 0
Stephenson	3593 0 0
Kelly	3569 0 0
Geary	3468 5 0
Blackburn	3407 0 0
Russell	3353 4 2
Barnes & Moody	3310 0 0
Dover, Dowel, Wills, & Co.	3300 0 0

LIVERPOOL.—For new business premises in Ranelagh-street, near to the New Central Station. Quantities supplied:—

Evans & Son	£5143
W. Tomkinson & Son	4577
T. Urmonson	4553
Ray	4547
J. Pollock	4515
W. & F. Witten	4388
Nicholson & Ayre (accepted) ..	4237

MALDON.—For new Union House at Maldon, for the Maldon Board of Guardians. Mr. Frederick Peck, 35, Gordon-square, architect:—

Gozzett	£22,184 0 0
Perry & Co.	18,265 0 0
Jackson & Shaw	17,772 0 0
Bell & Sons	17,085 0 0
Runnacles	16,946 0 0
Everett & Son	16,298 0 0
Brown	15,700 0 0
Saunders & Son (accepted)	14,470 0 0

MANCHESTER.—For taking down and rebuilding two shops, Nos. 191 and 193, Oxford-street, Manchester, for Mr. Thomas Barber. Mr. G. S. Courtis, architect. Quantities not supplied:—

Barber & Gibson (accepted) £1300

SUSSEX.—For the enlargement of National School and master's house at Sayer's-common, Sussex. Goulty & Gibbins, architects:—

Ancombe	£594
Nell & Tuxford	350
E. Nash & Co.	348
C. F. Hollands (accepted)	299

THELVETHAM.—For new schools for the parish of Thelvetiam, Suffolk. Mr. R. M. Phipson, F.S.A., architect:—

Rednall	£470 0 0
Grimwood	468 0 0
Tooley	440 0 0
Cornish	437 10 0
Hawes	425 0 0
Bishop (accepted)	415 0 0

THELVETHAM.—For benching Thelvetiam Church, Suffolk. Mr. R. M. Phipson, F.S.A., architect:—

Tooley	£400
Hawes	400
Cornish	384
Grimwood	374
Bishop (accepted)	345

WITTINGTON.—For residence, with stabling and boundary walls, &c., for Robert Smelt, Esq., at Wittington. Mr. James Hull, architect. Quantities supplied:—

Southern	£2675 0 0
Harrison & Shaw	2590 12 0
Barber & Gibson (accepted)	2659 12 6

CONTRACTS OPEN FOR BUILDING ESTIMATES

WHARFEDALE UNION.—NEW WORKHOUSE, August 23.—For the erection of a new workhouse, entrance buildings, infirmary, &c., at Newall, near Otley.—Christopher Jno. Newstead, Union Clerk, the Board-room, Otley.

WRINGTON. August 26.—For the construction of sewers.—James and Simmons, Clerks to the Sewer Authority, Wrington.

BASINGSTOKE, August 23.—For the erection of new milk kiln and offices.—Mr. Joseph Greenaway, Architect and Surveyor, 121, Queen's-crescent, Reading.

BATH, August 24.—For the supply of about 900ft. of 24in., 2,000ft. of 18in., 2,000ft. of 15in., 2,500ft. of 12in., 9,000ft. of 9in., and 600ft. of 6in. glazed stone-ware pipes, with junctions and bends.—Alfred Mitchell, Engineer.

ABERGAVENNY UNION, August 30.—For the erection of infirmaries and fever wards, and sundry other additions and alterations at their workhouse.—William F. Batt, Clerk to the Guardians, Union Office, Abergavenny.

ACTON LOCAL BOARD, August 22.—Main drainage contract No. 10. For constructing 928ft. of 3 by 2 brick sewer, in Horne-lane.—Edward Mouson, C.E., Surveyor to the said Board, Acton.

WAR DEPARTMENT, August 23.—For the erection of an iron church at Fort Rowner, near Gosport.—W. C. Hadden, Colonel Commanding Royal Engineer, Royal Engineer Office, Portsmouth.

SWINDON NEW TOWN LOCAL BOARD OF HEALTH, August 22.—For supplying and laying about 6,010 feet of brick and stone-ware sewers, a tunnel about 700 yards long, reservoir, &c.—James Copleston Towns- end, Clerk.

BINGLEY, August 23.—For the Erection of a large Wesleyan Chapel.—J. P. Pritchett, F.R.I.B.A., Darlington.

BISHOP'S STORTFORD NATIONAL SCHOOLS, August 31.—For the erection of new school-rooms on a piece of land near St. Michael's Church.—George Perry, Architect, Bishop Stortford.

LEEDS, September 1.—For the erection of six houses, coach-houses and stable and out offices.—J. Hall, Architect, Belgrave-chambers, Leeds.

LEEDS, August 28.—For the erection of chambers in Cookridge-street.—H. Walker, architect, 11, East Parade, Leeds.

MANSFIELD CO-OPERATIVE INDUSTRIAL SOCIETY LIMITED, September 5.—For the erection of a corn-mill.—R. Ginthorpe, Secretary.

SALFORD, August 31.—For sewerage, levelling, and draining Plymouth-street.—E. Andrew, Clerk, Town Hall, Salford.

SURREY, August 22.—For building new schools, and teacher's residence, at Grafton, Dunsfold.—Mr. Geo. Cox, Farncombe, Godalming, Grafton.

HORNSEY LOCAL BOARD OF HEALTH, August 28.—For the construction of an outfall sewer, in connection with Metropolitan Northern High Level Sewer, with the internal sewers, for the sewerage of their district.—Wm. Hammond, clerk of the board, 16, Fumival's-inn Holborn, E.C.

BILSTON IMPROVEMENT ACT, 1850, August 21.—For the erection of town hall, public offices, and free library buildings at Bilston.—John D. Wassell, clerk, Commissioners' Offices, Bilston.

ROCHDALE AGRICULTURAL SOCIETY, August 26.—For the erection of a covered stand at their forthcoming show, to hold 800 persons.—James Taylor, secretary, 2, the Orchard, Rochdale.

STOCKPORT, August 21.—For the erection of St. Matthew's National School, Edgeley.—John B. Eskrigge, Esq., Hollywood, Stockport.

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Best Green Slates 14 by 7 ...	2 17 6	16s. 6d.
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LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.

	LEAD.		
Pig—Foreign	per ton	£17 10 0	£17 12 6
" English W.B.	do	20 5 0	20 10 0
" Lead Co.	do	18 10 0	18 15 0
" Other brands	do	18 0 0	18 5 0
Sheet Milled	do	18 5 0	19 0 0
Shot, Patent	do	20 10 0	21 0 0
Red or minium	do	20 10 0	0 0 0
Litbarge, W.B.	do	0 0 0	0 0 0
White Dry	do	25 10 0	26 0 0
" ground in oil	do	0 0 0	0 0 0

COPPER.

British—Cake & Ingot	per ton	75 0 0	76 0 0
Best Selected	do	77 0 0	78 0 0
Sheet	do	76 0 0	81 0 0
Bottoms	do	82 0 0	83 0 0
Australian	do	76 0 0	79 0 0
Spanish Cake	do	68 0 0	70 0 0
Chili Bars, cash	do	67 0 0	69 0 0
" Refined ingot	do	76 0 0	0 0 0
Yellow Metal	per lb.	0 0 6½	0 0 7½

IRON.

Pig in Scotland, cash	per ton	3 2 6	0 0 0
Welsh Bar, in London	do	7 5 0	7 10 0
" " Wales	do	6 12 6	6 15 0
Staffordshire	do	7 15 0	8 5 0
Rail, in Wales	do	6 15 0	7 0 0
Sheets, single in London	do	9 5 0	10 5 0
Hoops, first quality	do	8 15 0	9 5 0
Nail Rod	do	7 10 0	7 15 0
Swedish	do	9 15 0	10 0 0

OILS, &c.

Seal, pale	per ton	33 0 0	0 0 0
Sperm body	"	80 0 0	81 0 0
Cod	"	35 0 0	0 0 0
Whale, South Sea, pale	"	33 0 0	33 10 6
Olive, Gallipoli	"	51 0 0	52 0 0
Cocconut, Ceylon, tun	"	51 0 0	0 0 0
Palm, fine	"	37 0 0	0 0 0
Linseed	"	32 10 0	32 15 0
Rapeseed, Eng. pale	"	43 0 0	43 5 0
Cottonseed	"	29 0 0	35 10 0

TIMBER.

Teak	load	12 5 0	13 10 0
Quebec, red pine	"	3 15 0	4 15 0
" yellow pine	"	4 5 0	5 5 0
Quebec oak, white	"	6 0 0	6 5 0
" birch	"	3 10 0	4 10 0
" elm	"	3 10 0	4 0 0
Dantzic oak	"	4 10 0	6 10 0
" fir	"	2 7 0	4 0 0
Memel fir	"	2 15 0	3 0 0
Riga	"	3 5 0	3 10 0
Swedish	"	2 0 0	2 10 0
Masts, Quebec red pine	"	4 0 0	6 10 0
" yellow pine	"	4 0 0	6 10 0
Oregon	"	7 0 0	10 0 0
Lathwood, Dantzic, fm.	"	3 0 0	4 10 0
" St. Petersburg	"	4 15 0	5 15 0
Deals, per C, 12ft. by 3 by 9in.	"	12 10 0	13 10 0
Quebec, white spruce	"	12 10 0	14 0 0
St. John, white spruce	"	12 10 0	14 0 0
Yellow pine, pr reduced C	"	18 0 0	19 10 0
Canada, 1st quality	"	12 5 0	13 10 0
" 2nd do	"	12 10 0	14 10 0
Archangel, yellow	"	13 0 0	13 10 0
St. Petersburg, yellow	"	7 10 0	8 0 0
Finland	"	0 0 0	0 0 0
Memel and Dantzic	"	8 10 0	10 10 0
Gothenburg, yellow	"	8 10 0	9 0 0
" white	"	10 10 0	12 10 0
Gefle, yellow	"	8 10 0	12 0 0
Soderham	"	10 10 0	12 0 0
Christiania, per C, 12ft. by 3 by 9in., yellow	"	10 0 0	12 10 0
Other Norway	"	7 0 0	8 0 0
Flooring boards, pr square of lin., first yellow	"	0 9 0	0 10 0
First white	"	0 8 0	0 9 0
Second qualities	"	0 6 0	0 8 0

BANKRUPTS.

TO SURRENDER IN LONDON.

Holden, Howard Ashton, Bedford-square and Ethelburga House, Bishopsgate-street, builder, September 7, at 11.

TO SURRENDER IN THE COUNTRY.

Greenfield, Hannah, Horsham, late builder, September 5, at Brighton—Rinder, John and Samuel, Leeds, contractors, August 24, at Leeds.

PUBLIC EXAMINATIONS.

September 4, J. Jowett, Liverpool, timber bender—September 29, H. Saunders, Isleworth, builder—September 20, R. Nicholas, Bridgnorth, painter.

DIVIDEND MEETINGS.

September 15, J. Bates, Wolverhampton, brick and tile dealer.

SCOTCH SEQUESTRATIONS.

John Paterson, Glasgow, contractor, August 15, at 12.

PARTNERSHIPS DISSOLVED.

Allen Brothers, Worcester and Tipton, timber dealers—Tupper and Co., Moorgate-street, Commercial-road East, and Birmingham, galvanised iron merchants—Fox and Harrison, Bradford, masons—Gosley Brothers, Bristol, brassfounders—Holmes and Bassett, Birmingham, plasterers—Broad and Harrison, Tipton, engineers—Stafford and Canovan, Reddish, masons—Swarbrick and Ainsworth, Preston, plasterers.

ALEXANDRA PALACE & MUSWELL HILL ESTATE TONTINE.—Offices, 5 and 6, Great Winchester-street-buildings, E.C.

ALEXANDRA PALACE.—Notice to the Public. Intending Subscribers can obtain Tickets to view the Palace and Grounds on application to the Secretary, stating name and address.

ALEXANDRA PALACE.—Arrangements will be made for an early opening of the Palace and Grounds to the Public, for completing the Railway into the Palace, as well as other Railway communication.

ALEXANDRA PALACE.—The advantages to Subscribers of One Guinea and upwards are fully detailed in the Prospectus, and Subscribers incur no liability, and must benefit.

ALEXANDRA PALACE.—Art Union. £500 for a Guinea.

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ALEXANDRA PALACE.—The object of the Tontine is to provide for all classes of the inhabitants of the metropolis, and especially of its northern and eastern portions and suburbs, and for the many thousands of country Excursionists, a Grand Institution of healthful recreation and elevating instruction, which will combine the solid advantages of the South Kensington Museum and Schools of Art with the lighter pleasures and pastimes of the Crystal Palace at Sydenham, thus giving effect to the large and enlightened views of the late Prince Consort.

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Trustees—

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Or a share in the realisation of the estate in 1886, which it is expected will very largely exceed the amount paid in;

Or, say these privileges may at any time be commuted for admissions to the Palace and Grounds. (An E. Certificate includes all privileges.)

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THOS. DIXON, Secretary.

NATIONAL INSTITUTION FOR DISEASES OF THE SKIN.

Physician—Dr. BARR MEADOWS, 49, Dover-street, Piccadilly, W.

New Patients are admitted at 227, Gray's-inn-road, King's-cross, W.C., on Thursdays—Morning at Ten, Evening from Six till Nine.

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THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 25, 1871.

FOUNDATIONS OF THE NEW LAW COURTS.

BY the end of next February it is confidently anticipated that the excavations now proceeding in the enclosed seven acres between Carey-street and the Strand will be completed, and the foundation "got in" ready for the magnificent superstructure that is to be erected on it. For some months back, carts heavily laden with earth and clay have been seen to emerge from four or five entrances leading to this enclosed space, to take their way through Temple Bar, and then be lost to sight amid the heterogeneous mass of vehicles that daily crowd and block up that well-known thoroughfare. Many persons have inquired the ultimate destination of these carts, but comparatively few have any idea where the "stuff" all goes to. It was not until we had witnessed what was going on inside the hoardings that we became informed on the subject. The first impression of any one standing within the temporary boundary of the seven acres is that everything relating to work is in a state of confusion, mounds of sand are heaped up here and there, great piles of old bricks, broken and unbroken, are thrown up on the ground at various irregular distances apart, quantities of gravel in one place, and bags of lime in another. But a very short time suffices, especially for the professional eye, to perceive that, in spite of this apparent disorder, there is method in the whole of it. The sand is deposited in places where it will be conveniently obtained when subsequently required in the building of the superstructure; the bricks are collected so as to be out of the way of the labourers; and the gravel and lime are placed so as to be at hand for the manufacture of the concrete, which is used on a very considerable scale. With respect to the nature of the material excavated, it is by no means of the uniform character that might be expected within an area of dimensions so limited. The "stuff" may be said to consist of earth, sand, and gravel, with some clay here and there. The manner in which the veins or strata of sand are dispersed is exceedingly striking. At one spot there will be a great solid mass of fine sand, almost perfectly clean and pure, while at a short distance from this accumulation there will be none whatever, or at the best but a thin layer, with earth above and below it. The greater portion of this "luck find" is run to spoil in a corner of the enclosure opposite Horseshoe-court, a great bank being formed of it, which is made up by tipping the sand from waggons drawn by horses on a tramway up the incline.

All the old bricks, the relics of demolished dwellings, the sand, the gravel, and the clay, can be utilised in some manner or other in advancing the building of the new structure, but the absolute earth must be got rid of by some means or other. It must be taken clean away from the site it has occupied for so many generations. In the open country the "shifting of stuff" is accomplished without much difficulty, but this is not often the case in London. Unless there is a great demand for "filling," such as occurred during the embankment of the northern side of the Thames, it is not an easy matter to get rid of a large quantity of excavation. When stuff is wanted, it is well paid for; but the conditions are reversed when it is not wanted, and there are practically no places where it can be shot. Contractors carrying out works in London are frequently compelled, as in the present case, to pay pretty smartly for getting rid of their loose stuff. The greater part of that excavated from the "seven acres" is carted

the river and sent down the stream in barges, where it is utilised on railways, and other works of a similar character. It is a tolerably long "lead" before it reaches its final destination. It is, in the main, all good dry stuff, well suited for forming embankments, and not liable to the shrinkage which invariably accompanies material of a sloppy, loose description. Only those who have had to do practically with the formation of high embankments are aware of the vast difference there is in this respect in the various kinds of earth.

The most casual observer of works of construction must have remarked the increasing use made of concrete by architects and engineers in even almost insignificant instances. As an example in point, take the new railings which encircle the people's gardens on the Thames Embankment. Instead of following the old plan of first laying down a stone base, and letting the iron uprights into holes made for the purpose, and flushing up with lead, the stone is dispensed with altogether. The uprights are simply set up plumb on a layer of concrete, and while in that position, the lower portion of them to a height of about nine or ten inches, is surrounded with concrete, which is held in its place by temporary boarding until it is thoroughly well set. The small boards are then pulled away, and the railings stand embedded in a base of solid concrete. It must be confessed that there is abundance of broken bricks and plenty of good gravel on the site of the New Law Courts to make first-rate concrete. On looking at the heaps of broken bricks ready to be utilised in this manner, it struck us for a moment, whether some day or other the Pyramids might not be demolished and pounded up for the same purpose. The concrete that is now being put in for the foundation of the central hall is composed of six parts of gravel and broken bricks to one of Barrow lime. As before stated, the old bricks as they are taken from the arches and pillars upon which the houses which have been destroyed were supported, as well as from the buildings themselves, are first broken into smaller pieces by hand labour. The debris and gravel are then mixed while in a dry state with the lime, and transferred to the mixer. This apparatus consists of a hollow cast iron cylinder, in the interior of which revolves a shaft carrying six strong iron arms. A portable engine is attached by the usual wheel and band gearing to this shaft, to which it imparts a horizontal revolving motion. At the time that the dry concrete is shovelled through a large rectangular aperture into the mixer, it is thoroughly wetted with water by means of a pipe which supplies a constant discharge into the apparatus. It is obvious that the concrete becomes not only completely mixed, but also reduced to smaller dimensions by being crushed to a certain extent by the arms of the shaft, as it passes through the cylinder to the lower extremity, where it is thrown out upon a platform, shovelled into barrows, run out on the staging and tipped into its place. The whole of the excavation has been taken out for the central hall, which occupies a site of nearly 300 feet by 100 feet. Over this space, the bottom of which is about 15 feet underneath the level from which the concrete is tipped in, a number of upright posts are ranged, and planks laid along so as to enable the wheelers to run the barrows in every direction, and tip the concrete in regular layers below. The depth of the concrete for the foundations of the hall is seven feet, and it is deposited in five successive coats or layers. Under that portion of the structure which faces the Strand, the depth of concrete is ten feet, and elsewhere five feet. A capital foundation has been reached on the London clay.

The practice of tipping concrete from a height is one that is of very ancient usage, but one which modern science has condemned. The objection to this plan is that in conse-

quence of the different specific gravities of the materials composing the concrete, they tend to become separated during the fall, and thus the principal value of the compound, which consists in its intimate incorporation, is lost. There is, undoubtedly, a good deal of force in the objection, but nevertheless, we see continually the old plan adhered to, as in the present instance. The truth is, that when concrete is used for the foundation of large buildings, which have a depth of at least 10 or 12 feet below ground, there is no other plan of depositing it, except by erecting a platform over the excavation, and tipping it in. In consequence of the great weight of the central hall, which results from the heavy description of its roof, it has been very wisely determined to disconnect it from the rest of the building, and lay the foundations of it separately. In other words, there will be a break in the concrete all round it, so that any extra settlement that might occur in this particular portion of the structure would be confined within its own limits, and not affect the remainder of the edifice. There are in all nearly 170,000 cubic yards of excavation to be got out, and the contractors, Messrs. Dove, Brothers, are pushing on the work as energetically as the nature of the locality will allow. It must be borne in mind that the excavation of the present site in the heart of London is a very different affair from the getting out of a railway cutting, where almost any number of men may be employed. The contractors have about 300 men at work on the ground, under their foreman, Mr. Lett, who is evidently well up to his business, and intends having the stuff cleared out by the time stipulated. A reasonable period will be allowed for the foundations to settle, and then it is to be hoped the New Law Courts will begin to "show up" above ground.

VIOLETT LE DUC'S "DICTIONNAIRE RAISONNÉ DE L'ARCHITECTURE FRANÇAISE." *

XI.

THE Crusades naturally encouraged military architecture. The long sieges held before the fortified places of the Panyon induced many improvements in attack—improvements which caused their inventors to adopt means of defence calculated to circumvent them when, on their return home, they rebuilt or added to their "old-fashioned" castles. One of the great improvements now effected was the addition of detached barbicans to the outworks. These, by jutting out from the main defences, compelled a larger circle of contravallation to be made, and the formidable "cats," as the stealthily moving, ever-watching, wooden towers were called, were thus compelled to be constructed at a more respectful distance than they had hitherto been obliged to keep. Moreover, they thus required a longer time to approach the walls, and when within the line kept by these barbicans were liable to be set fire to in a sortie of the garrison from their new defences. At that city of Carcassonne to which we have before referred, Saint Louis, on his return from the First Crusade, added a very fine specimen of one of these. Of this we gave a drawing (see last week's BUILDING NEWS) showing its restoration (Fig. 31). It will be seen that it is a large circular edifice, protected by a draw-bridge-crossed moat, and communicating with the château by means of a tortuous staircase, so constructed that the enemy must needs pass in front of a series of loopholed walls and between two high ramparts to reach the castle itself. Both the barbian and castle were built by S. Louis, and both are crowned with those wooden "hoards" which preceded the advent of stone cor-

* Dictionnaire Raisonné de l'Architecture Française du XI. au XVI. Siècle, par M. VIOLETT LE DUC, Architecte du Gouvernement, Inspecteur-Général des Edifices Diocésains. 10 vols.; 8vo.; Morel, Paris, 1854—1868.

belled machicollations. Long ledges of timber were run out from the walls and partially floored over with planks, leaving interstices through which heavy or annoying missiles might be hurled down upon such sappers as attempted to breach the walls at their base. How these men reached these points is most graphically shown by two illustrations from the very artistic hand of the author. In the first of these (Fig. 32) we see a covered shelter to the men, drawn by capstans to the verge of the moat. Under cover of this, bundles of the fascines are thrown into the water, and as ditch is slowly filled, planks are laid down, and the cover advanced a little nearer. Trebuchets hurl huge stones on to the walls to drive away the garrison, and the moat is gradually bridged over. Now, too, approaches closer the skin-covered "belfroi" or "eat." Thus, protected by its hide from the fire-bearing missiles shot at it, and which fall harmless, with a rapid run down the inclined plane formed over the moat, the wall is reached (Fig. 33), the bridge which formed the mantlet on the top is lowered; up swarm the besiegers, and a hand-to-hand struggle is commenced on the narrow rampart. "Turkish stones," as the fire-bearing shells were called, set fire to the wooden hoarding. Scorched by the heat and blinded by the smoke, the defenders retreat, and if the dominating towers which rise up from the walls cannot confine the assailants to this one length it is all up with that place. Contrasting the present system of fortification with the past, M. le Duc some sixteen years ago wrote words which have a curious interest in them now. Little could he have thought then that he himself would ever witness some of those events he then imagined; but then, alas! he left out of his category of defence and attack that most potent of all the besiegers' weapons—famine. Out of this steady improvement there grew up between the eleventh and the sixteenth centuries the art of fortification. It is only by studying with care, and scrupulously examining the traces of the defensive obstacles of those epochs, that we can understand the records of those gigantic attacks which took place, and which we are oftentimes disposed to look upon as exaggerations. Before these well-arranged defensive means, we can easily picture up the enormous labours of the besiegers, those movable "belfries," those stockades, those ramparts, or those moving mantlets, which were superadded by a wary captain who foresaw and calculated all the chances of an attack, and who was determined never to yield one point without being able to retire into a stronger position. Now-a-days, thanks to artillery, a general who invests a place not relieved by an army in the field, can predicate the hour and the day when that place must fall. He can tell beforehand the moment and the place when the first breach will be made, and when the attacking columns will enter on such and such a work. It is a game more or less long in playing, but the besieger is always sure to win if his *matériel* does not fail him, and if he has a *corps d'armée* proportionate to the force of the garrison. "Place attacked, place taken," is the French dictum. That dictum has indeed been fulfilled, but not exactly by the means M. le Duc looked upon. No military architecture is availing against that foe the Prussians arrayed against so many fortresses and cities in the recent war. It is useless when the people ask for bread to give them stones. "There is nothing which more strongly marks the difference between the men of those distant days and the spirit of our own times," says M. le Duc, "than the comparison between a fortified place of the thirteenth, and one of the nineteenth century. In the latter case, in place of frowning keep and crenellated walls, we have an absolute invisibility of all means of resistance—hardly a bastion is to be seen. A *corps d'armée* takes a town almost without being seen by its defenders; they

have seen nothing but a few sloping earthworks and a little smoke. When a practicable breach is effected, it capitulates; everything falls on the same day. A little bit of wall is knocked down, a little earth thrown up, and the town, those bastions which have never even seen a puff of smoke, the magazines, the arsenals, everything is surrendered. A few hundred years ago everything was different. If a garrison was faithful and brave, it required, so to speak, a separate capitulation of each tower, and an individual treaty with each of the captains, if it pleased them to defend foot by foot the post confided to each of them. Each one counted only on himself, and defended his portion against all comers. In those days it did not suffice to take the capital of a country to have that country at your feet. Those past times might be barbarous times, but that barbarism was full of energy and resources. The study of these great military monuments of the middle ages is, then, not only curious; it teaches us the manners of an age which the spirit of the nation would only gain by engrafting." Since these words were written, we and their author have seen the capital of his country invested and succumb, and the nation immediately follow its fall. We have seen fortress after fortress fall, and with scarcely an exception they have fallen without even a practicable breach being made; and we have seen an utter absence of that individuality of boldness and doggedness of daring which formed such conspicuous episodes in the sieges and defences of old. Truly, indeed, did M. le Duc write that: "L'esprit national ne pourrait que gagner à se retremper." Many interesting records of those sieges are given by our author, but we cannot indulge ourselves in the luxury of reproducing them in our columns. We must restrict ourselves to a glance at their consequences, in the various alterations in the system of defence these numerous attacks induced. The use of the battering-ram had early taught the lesson that round towers were stronger than square ones, and we have seen that this form was adopted by the Gallo-Roman military architects. The size of these towers was increased, and then it was found that their front was almost protected from the defence of the curtain wall at the centre of each tower. Once here the attacking miner was comparatively safe, if the besiegers had destroyed the "boards" above him, and this led to a variation in their plan. Towards the end of the thirteenth century this was much varied. Sometimes it was composed of various portions of circles, as the *César Tower* at Warwick Castle; sometimes beaked, like the bows of a ship, as at Loches; and sometimes, as at Carcassonne, a pointed triangle was added to the circular form; and to the pointed form thus forced upon the fosses may be traced the birth of the polygonal system of fortification so largely developed by Vauban, which to this day bears his name. The wooden "boards" being so frequently destroyed by fire, as the powers of casting incendiary missiles became greater, it became necessary to replace them by stone. Thus arose that henceforth characteristic of military architecture, the machicolated parapet; and great was the ingenuity shown by the architect in corbelling these out so as to be at once secure, and yet to leave space enough for the defenders, and at the same time provide a means of roofing them over in war time. In peaceful times the castle's battlements cut out their dentilled edge against the sky; the sentry walked his rounds in the open air, seen of all men; but when the war trumpet sounded out, from magazine and store came long beams and rafters, and soon high conical roofs capped the towers, and long lines of low ones hid the garrison from the gaze and the aim of the foe. Men were individually precious in those days, and he was the best captain who could lose the fewest of his soldiers. We have changed all that now. In these advanced days it doesn't

matter how many you kill, provided you can still outnumber your enemy. This is the new principle inaugurated in the late American war, and which, we hope, has culminated in that European one which has just ceased. M. le Duc does not content himself with a review of military architecture only; he studies carefully the range and effect of long-bows and cross-bows, weighs the merits and notes the calibre of early efforts in artillery, and shows how each successive change in the science of attack induced some counter change in the science of defence. He marks how castles rose, and how they fell; how from the early earthwork rose the wall, and how that wall became lowered step by step, until in these days we have again reverted to the primitive dykes and ditches of our "barbarous" ancestors. Full of history, and crowded with wonderfully-executed illustrations, literary and graphic, this definition is one of the greatest interest. It shows most excellently that spirit of deductive reasoning which marks especially all that M. le Duc does, and which renders his book so widely different to the usual run of that dulllest of all dull literature, "architectural books." From it we learn how reflectively scientific were the architects of old—nothing came amiss to them, and they held their sway. The greatest architects and artists then thought it no scorn to "design" fortifications; and amongst others we may mention that Michael Angelo, Leonardo da Vinci, and that most amusing braggart Benvenuto Cellini, were frequently engaged in bringing all their science to bear for the defence of their country. When architects began to look upon their art rather as simply a veil to mask and cripple the requirements of a time and place, than as a demonstration how those requirements could be best met, their glory departed from them. Little men of little minds, hungry after 5 per cent., took the place of those great geniuses who preceded them. Military architecture became military engineering, and passed away from the architect's duties, as in these latter days their want of brains has driven away from them the noble chance of doing great things in civil architecture, and created the hideous science of civil engineering. Truly, indeed, may we take up and apply to ourselves, as architects, the words of our author, "l'esprit ne pourrait que gagner à se retremper." When studied in such a spirit, Archaeology is the handmaid of Progress, and not, as too frequently she is, the stepmother of Art.

ENGLISH GOTHIC MOULDINGS.*

MR. SHARPE, in the latest of his publications, seems to aim at doing thoroughly and once for all what has been repeatedly done in a partial and somewhat irregular manner. Almost every book on English Gothic contains some sections of mouldings, and several writers, amongst whom Mr. Paley is perhaps the best known, have arranged a multitude of them in a consecutive series. The present work differs from these in being more complete. It is a kind of parallel of mouldings, selected from our principal buildings, and classified according to the features to which they belong. Thus the first part consists of arched mouldings, the second of horizontal mouldings, and the third of vertical ones. The number now published forms one section of the first part, and deals entirely with pier arches. Of these there are sixty plates, arranged according to date, the six periods into which Mr. Sharpe prefers to divide the duration of Mediæval styles in England being distinguished each by a different colour. These colours, we are informed, follow each other in the same order as those in the prismatic spectrum. We should see no great

* "The Mouldings of the Six Periods of British Architecture, from the Conquest to the Reformation." By EDMUND SHARPE, M.A., F.R.I.B.A. No. 1. London: E. and F. N. Spon.

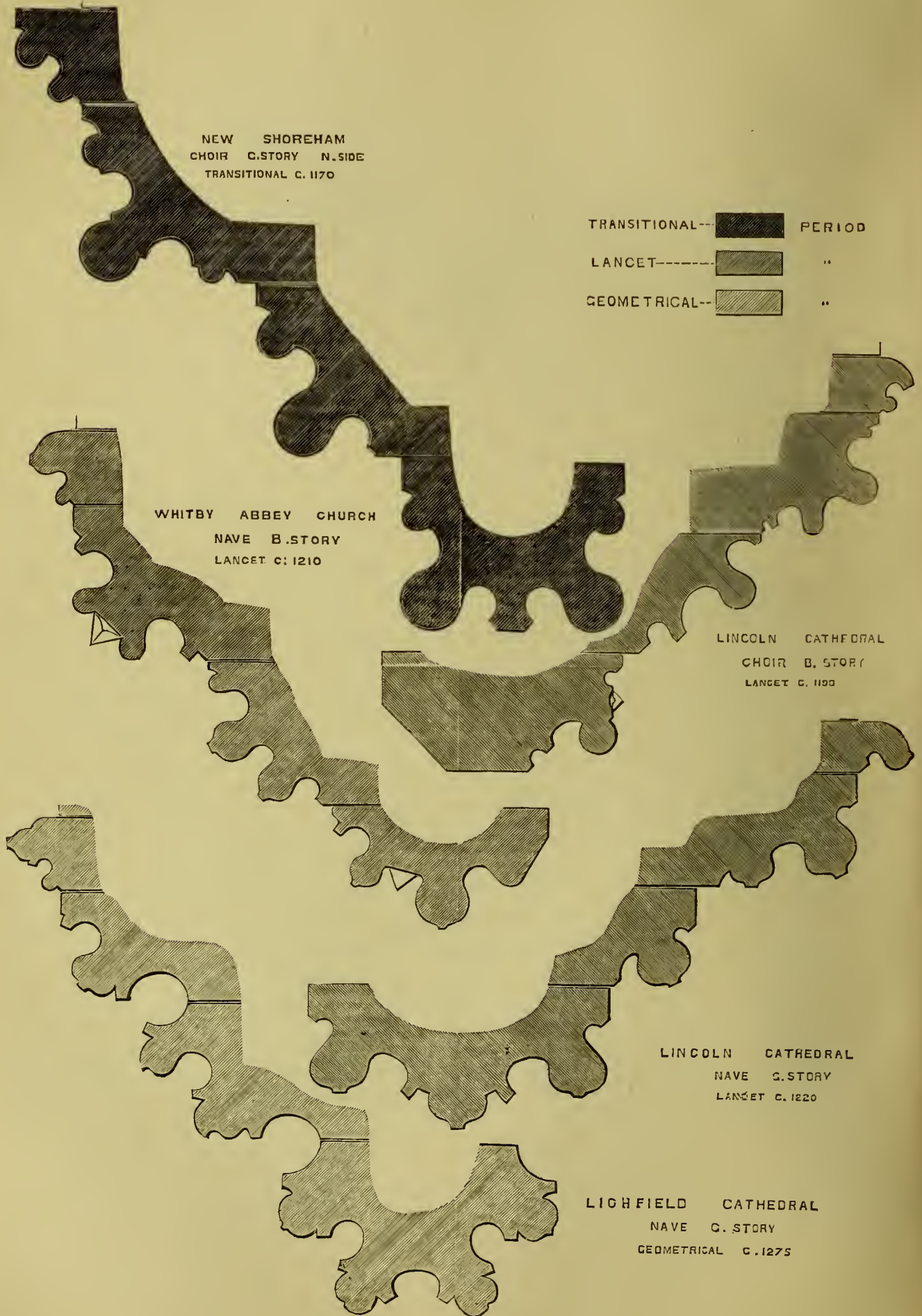
advantage, however, in this device, even if the tints employed resembled far more closely than they do the hues of Nature; for, in any case, we apprehend that nine-tenths of the people who consult the book will know a Norman pier arch from a Perpendicular one without puzzling themselves as to whether black comes before crimson in a rainbow. The names which used to be applied to the prismatic colours, and by which, from old associations, many persons still find it easiest to remember them, were violet, indigo, blue, green, yellow, orange, and red. Mr. Sharpe makes his black, blue, green, yellow, red and crimson, and so loses the advantage of the familiar list. This, however, is a trifling matter, especially as the period and supposed date are printed in capital letters at the top of each page. But there is a more serious objection to the dazzling effect and indistinct outline of the plates in red and yellow. No one whose sight is not of the strongest can look without pain at the Geometrical and Curvilinear sections; it is a perfect relief to turn back to the Norman division, and see the plates in plain black and white. Not only is the brightness of the colour fatiguing to the eye, but the dimness of the outline is perplexing. To avoid trouble, the whole plate is printed at one operation, and so if the sectional ground is etched in yellow, the profile is in yellow also. It will readily be imagined how difficult it is to follow a contour in so pale a tint; and to see it properly, the first idea that suggests itself is to ink it over. There is one other improvement which we should be extremely glad to see, and after indicating this we will proceed to the meritorious points of what really promises to be a very valuable work. At present the section of each pier arch is shown, to half or one-third the real size, on the separate blocks which compose it, and as the page is not large enough to let them follow each other in orders, they are dispersed all over it to fill it up. To form an idea of what the arch really looks like, it is necessary to get a clear idea of the hood mould, H, then imagine it placed on the top of the first order, I., and this on the top of the second order, II., and so on until the group is completed. But every group of mouldings has, or ought to have, a definite expression, a character of its own, and by such a scheme as this the character inevitably disappears. However correct may be the sections of each separate order, there is no judging of the whole result until they are fitted into their proper places. The details of the separate arch stones, scattered over a page, give no better idea of the look of the arch than a series of details showing a man's nose, eyes, and mouth would give, in their separate state, of the appearance of his face. It would, therefore, greatly increase the value of the work, especially as a parallel between the several buildings referred to, if a general section of the whole group, no matter to how small a scale, were appended to each plate.

The first number commences with an Early Norman pier arch (date c. 1090) from Worcester Cathedral. Here we have, not the angle roll which is so common in somewhat later work, but the roll occupying the corner of a square recess. This arrangement may be more fitly called a last relic of Classic detail than a first germ of Gothic. The angle bead, rather than the nook bead, was doubtless the parent of most Mediæval forms, but still the latter did not disappear without leaving here and there a trace of its former influence. At Gloucester Cathedral (c. 1100 A.D.) the angles are still square, but there are three semicircular rolls applied to the soffit of the lowermost order. The next plate, from Southwell Minster, shows a much further development. In this case the outer rim of the arch has not only a bead, but a quirked hollow on its corner, and the inner one has a large roll, also quirked. At S. John's, Chester, the same details are employed, but one of the hollows, instead of

being circular, has a curious elliptical curvature. Peterborough Cathedral, a little later in date, is scarcely so advanced in style, and New Shoreham (c. 1130) has merely angle rolls, without any hollows. But at this point comes a sudden and marvellous change, and we could wish for some example, a transition to the Transitional style, to show how it came about. In New Shoreham (c. 1170), we have, for the first time, rounds passing into hollows with no intervening line; the hollows, too, are getting deep, and the rounds are becoming elongated, and even pointed. On the opposite side of the same church, the pointed boutell is fully adopted and freely employed; not only flanked by hollow quirks, but by those peculiar ogee shaped members which, in this situation, are more characteristic of Early French than of English detail. Selby Abbey Church supplies a very curious group of the same age. The two outer orders have, between bold quirked hollows, those peculiar ogee pointed rolls which look as if they were made on purpose to be broken. So far there is nothing unusual; but the soffit of the inner order is in quite another style. Having no hollows, it consists of one wide series of projecting rounds, divided by V shaped members, or double quirks. There is a small roll on each angle, then a semi-circular roll, then again a portion of a roll forming about a quarter of a circle, and lastly, in the centre of all, a large stilted roll, standing out as much or more than its breadth. It looks like an attempt to produce an elaborate group while the principles on which elaborate groups could properly be formed were still unsettled. Another example from Selby shows the same idea worked out with pointed boutells instead of round ones; while a third is an experiment on the use of wide and shallow concave members. Mr. Sharpe gives us a large selection, though not at all too large, from the details of this interesting period. S. David's Cathedral, Abbey Dore, Furness, Tynemouth, Wells, and Chichester, are all laid under contribution. The first has a certain stiffness and clumsiness about its sections; in the second and third they are broad and strong, but deficient in shadow. At Tynemouth the filleted roll makes its appearance, and the fillet, too, is a wide one, and joins the roll, not by an angle, but a flowing curve. In these two points it has some resemblance to the corresponding feature in the Curvilinear or Flowing Decorated style. The expression, however, differs widely, for in the Early example the roll is a strictly circular one, instead of being flattened or elongated or bulged out at the sides according to later practice; the band, too, which connects it with the fillet, is small and sharp, and quite unlike the attenuated ogee of the decaying Gothic. The pier arches from Chichester it is difficult to describe. Their designer had thrown aside Romanesque traditions altogether, and given the reins to his fancy in a way which even his successors seldom rivalled. He delighted in narrow-necked rolls with a reflexed point drawn quite to one side; in wide undercut hollows of irregular section, and especially in that beautiful and characteristic mark of Early work, convex above and concave beneath, which might perhaps be called the bird's beak moulding.

The Lancet period Mr. Sharpe begins with a selection from Lincoln Cathedral. Our illustration contains, on a reduced scale, two of his examples from this building. The member in the outer order of the first one, formed by two rolls connected by a slight hollow, is always beautiful, and is freely employed elsewhere in this cathedral. The hood mould in this case we cannot speak of with great admiration; it looks almost Perpendicular in the splay of its nosing, though fifteenth-century workmen would perhaps have found their patience fail in executing the undercut cavity beneath. From Hexham there is a group (dated c. 1190) chiefly

remarkable for the skilful contrast of large with small roll mouldings, and the preference for gradated lights and shades rather than for sharp edges and fillets. At Carlisle Cathedral this tendency is exhibited with less skill, and results in one of those undulatory, up-and-down groups which have little more special character than the reeding or fluting of a Classic column. They exhibit what appears to us the worst tendency of Early English mouldings, and that which often prevents them from equalling foreign, and particularly French ones, the tendency to become mere formless bands of light and shadow. The builders of the Presbytery at Worcester Cathedral determined, on the contrary, that there should be no want of sharp separation between the rounds and hollows in their pier-arches, so the latter in almost every case coil round and bite a piece out of the side of the former. This, no doubt, gives a sharp shadow, but it does not give a beautiful section, and as sections usually become, by means of the arch joints and otherwise, an important element of effect, it is worth while to attend to their outlines as well as their *chiar' oscuro*. A group from Whitby, which comes next, is remarkable for the very large roll and fillet in the centre of the soffit. In this special position, indeed, its size is not unprecedented, and we have now before us two or three arch sections from various places in which the same thing occurs. The feature seems, in fact, to be, not perhaps a development, but rather an imitation of those great semi-cylinders, sometimes a foot or more across, which often occupied this place in the earlier Norman period. A second example from Whitby, which we illustrate, is more satisfactory than that just referred to. This, and our second group from Lincoln, show the Lancet, and we might say the English Gothic style generally, almost at its best. There are no more circular curves, unless in parts of the smaller beads. Everything else is drawn by hand, with a varying sweep which puts every point of light and shade just where experience shows it to be most effective. Both the hood-moulds are good ones, and the members generally are well formed, and well contrasted as to size and position. A little more variety, indeed, might be desirable in both cases, especially in the occasional substitution of some other detail for the ever-recurring roll and fillet. Other specimens in this style suggest plenty of such alternatives: the pointed roll, the double roll with a V shaped fillet in the centre, the semicircular hollow between two halves of a filleted roll, the plain circular roll, and even the scroll moulding. Of these, the first is perhaps the most effective, and at a distance from the eye, hardly anything else can compare with it. But all of them have their place, and several of them, in the most perfect class of work, often find a place together. Another group, from the nave of Lincoln Cathedral, does show some of them in conjunction. The outer ring of the arch (for it will be remembered that the whole of the present number deals with pier-arches) has a very effective combination—a delicate ogee-pointed roll contrasted with a boldly-swelled-out roll and fillet. The latter is of the sort—for which it is much to be desired that there was a special name—in which the roll is much wider than it is deep, and in which, instead of turning up in a reversed curve towards the fillet, it doubles downwards into itself in a sort of dimple, against which the square projection is abruptly set. The next order has also an ogee-edged roll, projecting, contrary to the usual custom, far beyond the face of the stone; and in addition to this, it shows, on its angle, what would have been a circular one, had not the adjoining hollow encroached on it and scooped a segment out of its side. As it is, it forms a sort of bird's beak profile, by no means common in such a place. A page from Worcester and another from Ely complete Mr. Sharpe's display of Lancet details under the present



head. In the former the fillet scarcely appears. All the projecting members but one are either plain rolls, or rolls with a little circular head pinched up, as it were, along their middle, and there is some tendency to the reedy, expressionless type, which makes some groups of mouldings little more than bundles of bent rods, with no centre, no climax, no main, and no secondary divisions. In the latter, the arch section from Ely, there is a hood-mould of very beautiful profile, and little else to deserve remark.

The Geometrical period is illustrated by details from Lincoln, Hereford, Chichester, Glasgow, Lichfield, Chester, Bridlington, Selby, Guisborough, and S. Mary's Abbey, York. Their dates range from about A.D. 1256 to 1290. At their commencement they differ very little from the later specimens of the preceding style. There is, of course, no such gap, no such sudden outgrowth of novel forms, as marked the change from Round to Pointed architecture. The roll and fillet and the ogee pointed roll, as, for want of a better name, we may venture to term it, still hold their own. The first modification that appears is in the width of the fillet. At Glasgow this soon becomes something astonishing, amounting in one case to no less than four inches. In England such a size as this was rare, even in the latest period, but all along the tendency was in that direction. The originally convex surfaces were cut up by flat ones, whose size was constantly on the increase, and the originally flat ones were hollowed out, so that at every step the work became more weak and wiry, fuller of edge-lines, and poorer in broad and gradated masses. The application of two or three fillets, instead of one, to each roll aided strongly to produce this effect. It broke up the convex faces, and thus, instead of a three-quarter circle or ellipse, we see only a sixth or an eighth of one at a time, while very soon, as in the Geometrical arch mould from Hereford, even this fraction was lessened by turning it into an ogee. Here, it is true, small beads are used instead of angular fillets on the sides of the large ones, and this may possibly have indicated a faint reaction towards sounder practice. At S. Mary's, York, the mouldings of this date had the merit of being behind their age, and except by the shallowness of the hollows, differ very little from the purest Early English. Lichfield, an example from which we have repeated in our illustration, is far more advanced. The square projections are broad and freely applied, there is little shade in the cavities, and the projections are chiefly varieties of the scroll-moulding. This moulding likewise makes its appearance at Chester, this time in company with the plain, the filleted, and the ogee-pointed roll. At Selby and Guisborough we have what may be termed the "undulatory system" applied to the details of this period; but, at least, it rids us of the superabundant quirks and ridges, and so far becomes praiseworthy by comparison.

Passing on towards the Curvilinear, or what is usually known as the Flowing Decorated period, we are glad to find the major part of the book behind us. It may be from the comparative scarcity of work of this period that so few specimens of it are here provided; but this reason certainly cannot account for the brevity with which that of the ensuing period is dismissed. The author has, we think, exercised a wise discretion in not overloading his books with instances of what is only fit to be avoided. These later styles, as far, at least, as their ornament is concerned, are abandoned in nearly all but the pseudo-Gothic structures of the day, and the architects of these rarely waste much time on the study of mouldings or anything else. Making allowance for the ingrained poverty and shallowness of the Later Decorated, we find here some tolerable arch sections from Howden and Lichfield. The former, which employs, in place of a hollow, an ogee of which the

convex part is relatively small and sharp in curvature, may be noticed as showing how extremes sometimes meet, an almost identical form being used for the same purpose, commonly in Early French, and occasionally in Early English work. In its older application, however, the concave part of the ogee generally meets the roll at an angle, like a quirk: in its subsequent one it is divided from it by a fillet, and this small and apparently trifling difference is enough to make a wonderful change in the character and expression of the group. The pier arches at Beverley have a feature which, at least in certain localities, is commoner than might be inferred from its rarity in the present collection. It usually occurs on the sides of a filleted roll, and resembles the half of a much smaller roll hollowed on its outer side by the curve of the adjoining cavity. At Ely Cathedral we first see the regular three-quarter circle take the place of the freely-curved sinkings of earlier work, and thence to the Perpendicular sections of Newark and Beverley the transition is not great. We observe the wide, flattened hollow which has often been held a mark of very late date, at Trinity Church, Hull, set down at about A.D. 1370. Of the Perpendicular wave moulding, with its usual enclosing chamfers, no instance is given, and we have even failed to notice its Decorated variety, so frequent in the pier arches of our minor churches. Mr. Sharpe's researches throughout have to do only with work of the first rank: or it is not until he comes to the decadence of Mediæval art that he refers to such buildings even as Newark or S. Michael's, Coventry. For this there may possibly be a reason in the subject. Many a village church with rich doorways or elaborate arcading has plain chamfered pier-arches, and so for these the collector is in a manner driven to abbeys and cathedrals. But since the practical business of us all lies far more in comparatively small works than in large ones, and since many—though by no means all—small churches were anciently built with the highest skill and ability, we trust that this most useful, if not most showy, class of models may find a prominent place in future numbers of the book under notice.

There is still another wish, which must have occurred to every one who has had the task, on however small a scale, of trying to describe groups of Gothic mouldings—and that is, that some definite names could be fixed upon and generally adopted, for their principal constituents. We have, it is true, the *roll*, otherwise called the *boutell*, the *pointed roll* or *pointed boutell*, the *roll and fillet*, the *scroll moulding*, the *wave moulding*, the *ogee*, and the *brace-moulding*. But how many well-marked and distinctive forms have no name at all, or none that would be generally intelligible? How are we to designate that excellent, though not very common Lancet moulding, of which one variety occurs in the outer order of the first section in our illustration from Lincoln Cathedral? In one phase it might be described as two rolls separated by a hollow; but it can hardly be termed so when the hollow has grown so slight as to be barely perceptible. It occurs, if we remember rightly, in some of the shaft capitals at Peterborough Cathedral, and in the door-jambs of several Northamptonshire churches; and something like it, modified much more than improved, is rather a characteristic member of the plinths and bases in the later Gothic. How, again, are we to distinguish the pointed roll formed by the meeting of two circular curves, from the other pointed roll, formed by the meeting of two straight lines rounded off at the back to the quirks from which they spring? Again, by what titles can we ever discriminate between the numerous, the almost countless, varieties of the roll and fillet? As regards the slighter shades of difference, the case indeed is hopeless. There is no fixing down this Protean feature to rigid shapes and

definite configurations; to find a separate name for each of its separate forms would be as vain as to try and name each separate cloud as it appears in the sky. Yet, as even there, description has been made partly possible by generic titles, so it surely might be here by a similar method. There is no reason in the nature of things why the one term "roll and fillet" should be applied equally to twenty different forms, varying as much and often far more from each other than a *cyma recta* does from an *ovolo*. It is worth while to enumerate just a few of the shapes that bear this all-including title. First, there is the circular roll with a small rectangular fillet planted on it at the middle of its exposed surface; that is, supposing it to be an angle roll, just at the corner of the square block from which the moulding was worked. Secondly, there is a similar roll, with the fillet placed on one side instead of at the corner. This is quite a different looking feature from the other one, but it is likewise known as a "roll and fillet." So, moreover, is the third variety, in which the fillet joins the roll by a hollowed curve instead of by an angle, though this hollow keeps on growing larger and larger, and the side of the roll approaches more and more closely to an ordinary ogee. A fourth variety, or rather group of varieties, exhibits the roll no longer circular. It may be drawn out into a sort of elliptical section; it may be bent round to the left or the right, so that its axis, instead of being straight, is curved; it may be flattened at the top, and made to bulge prominently at the sides, and this peculiarity may proceed so far that the fillet even seems to be squeezed in at the junction of two rolls, which project as far as itself. Again, such rolls and fillets as those at Glasgow Cathedral, which have become nearly all fillet, and scarcely any roll, need to be distinguished somehow from the delicately-ridged cylinders, so opposite in proportion, of the earliest Gothic. Then, what are we to say of the rolls with two fillets, of which both may be on the sides, or either may be placed centrally? And how are we to mark the cases where the face of the side fillet is vertical, and those, on the other hand, where it is a diagonal plane, facing, as the case may be, upwards or downwards? By what name shall we know that roll and fillet of the Decorated period which would be a roll and a triple fillet, only that two small beads are substituted for its lateral appendages? We might prolong the list, but these instances may show that the "roll and fillet" ought to be the name of a genus or a family, not of a species. Proceeding to other members, what name is there for that most graceful of Early English abacus mouldings, whose profile curls over from above to meet an undercut hollow with a bead or chamfer beneath? What name is there for that other almost equally beautiful one, formed also of a round and hollow, but in which the latter, stopping in a flat base, is a mere quarter circle instead of a shadowy sinking? What name is there even for one of the commonest of early abacus and bell mouldings, from the transition Norman period onwards, which resembles the upper half of a roll and fillet, whose underside had been transformed into a cavity? What name is there for that Early arch moulding, found, amongst other places, in the building known as John of Gaunt's stables, at Lincoln, which exactly resembles a pointed roll having its point removed by a small groove? There is an instance of it in Mr. Sharpe's work from Furness Abbey; but how to allude to it, otherwise than by describing it, we are quite unaware. What, again, are we to call that common Early English arch moulding, a quarter or more of a circle between two fillets set at right angles to each other, sometimes meeting them abruptly, sometimes smoothed off to join them by reflexed curves? Should it be described as a wave moulding, or as half a triply-filleted roll, or is it not possible

to devise some term simpler and more accurate than either? The lateral wings, again, which are neither fillets nor heads, often attached to the later Decorated roll—rounded above and hollowed beneath, so that the two curves meet in a sharp arris and form a sort of beak—they surely deserve, for convenience sake, some short and easily remembered appellation. All the forms we have mentioned, it may be objected, are mere developments of a few primary ones. Very true, and some people suppose in like manner all animals and plants to be developments of a few primary species. But we never met with any one who thought it less necessary on this account that they should each have appellations of their own, or who, instead of speaking of a horse or a donkey, alluded to the modified descendant of an equine animal of the Miocene epoch. This, however, is analogous to what has to be done at present in speaking of mouldings. Taking the roll, or roll and fillet as a starting point, it is constantly necessary to describe, by roundabout and only half intelligible language, the shape into which it has been turned and twisted in each particular example. At best, there is a great risk of being misunderstood, and even the simplest combinations can hardly be spoken of to any purpose without incessant reference to outlines and illustrations. A score of additional terms, well selected, or well invented, would be a boon for which every one who takes an interest in the subject ought to be thankful. It would be a considerable step towards popularising the science of mouldings, which now, to superficial apprehension, is so full of vagueness and mystery. We should rejoice if Mr. Sharpe, in the promised directions for arrangement at the close of his book, should take the subject into consideration. It would be fully fitting that the most complete work on English mouldings should be accompanied by the most complete nomenclature.

THE ARCHITECTURAL ASSOCIATION'S EXCURSION.

By ONE WHO WAS THERE.

MONDAY, JULY 31.—Arrived at Ely this morning about 11. First view of Cathedral, as seen on approaching it by rail from the south, not impressive. It improves, however, on a nearer approach, and though the exterior lacks the grandeur of many other cathedrals, it is impossible to gaze upon it without admiration. The whole of the interior beautiful in the extreme. A dozen members already hard at work with sketch-books and two-foot rules. Some have been here since Saturday. Galilee Porch attracts the greatest attention, and there Mr. Sharpe commences his lecture upon the Cathedral. Number of excursionists smaller than had been anticipated, but still a large party. Dean and Archdeacon present, with other clergymen and gentlemen; and "sweet girl graduates with golden hair," or, more properly, young lady amateurs, with pencils and programmes, give variety to the gathering. Impossible to give in available space even an outline of Mr. Sharpe's most interesting remarks upon the cathedral; specially interesting and specially instructive because every observation was illustrated by the object of remark itself. The cathedral itself was before us, and in it every phase of Gothic work could be studied, and, with so able a Mentor, studied to the best advantage. Evensong in the choir before Mr. Sharpe has concluded, so an adjournment is made, enabling the members to take part in the service; at its termination the thread of Mr. Sharpe's lecture is taken up and brought to a conclusion. Not only is the cathedral properly visited and described, but the surrounding buildings also, embracing the remains of the infirmary of the monastery, Prior Cranden's Chapel, with its elaborate tessellated pavement, &c., and many other "tit-bits" of interest. Trinity Chapel, also,

entered from the north transept of the cathedral, and used as a parish church, is also visited, and its most beautiful and intricate carving and nobly-groined roof examined as carefully as time permits. Probably in no other building in England of the same size is there such variety, delicacy, and abundance of carved ornament as here. The material is "clunch," a kind of hard chalk; it is eminently adapted for minute detail, and the artists to whom we owe Trinity Chapel have to the fullest extent utilised the capabilities of the material. Dinner at the Lamb Hotel at half-past seven. Mr. Sharpe in the chair. The Dean and Archdeacon right and left of him. After dinner a little speechifying. Thanks to the Dean and Chapter for allowing access to all parts of the cathedral. Reply from Dean, ditto from Archdeacon. Always glad to have intelligent visitors to their cathedral. At nine the cathedral is opened for us, and we are favoured with an organ performance. Cathedral in utter darkness, and consequent unusually solemn effect of the "Dead March in Saul." Trinity Chapel lit up so that we may study its carved work by gaslight. On returning to the cathedral we find it also lighted up, and a careful examination of the reredos and the monuments in the choir is made. Discussion as to the extent to which colour and gilding may be introduced into architecture, and especially upon stonework. Mr. Sharpe advocates at the most a very sparing use of such, and his opinion is generally concurred in by the party. One by one the lights are extinguished, and the faint light entering through the clerestory windows hardly prepares us for the brilliant moonlight outside, which bathes the exterior of the cathedral here in silver glory and there in deepest gloom.

TUESDAY.—Adventurous members make their way by devious passages and steep narrow stairs to the summit of the west tower and of the central octagon. The construction of the latter (timber, covered on the outside with lead) attracts considerable notice and study. The ascent to the top of the octagon is made up a sort of pipe in one of the angles, which a flying buttress intersects midway in its height. Once at the top, however, there is a fine view of the surrounding country.

By 10.40 train from Ely to Watlington station. Walk to the church of Wiggenhall S. Mary Magdalene, a Rectilinear structure, with some good woodwork in the shape of bench ends, &c. Embark on boats on the river, and row down to Wiggenhall S. Germain's, another Rectilinear church, particularly rich in bench ends, which have been illustrated in Colling's "Details of Gothic Architecture." Return to the boats, and descend the river a little further. Then land and walk to Wiggenhall S. Mary the Virgin, a fine church with some more excellent bench ends. Well-moulded Early English arch to south entrance doorway. Cymographs at work at it and other parts. Return through the fields to the boats, and discuss luncheon as we row down to Lynn. A rush through the town brings us to the railway station, where we book for Dersingham. Arriving there we find 'buses waiting to take us to the church. A rich treat here in a very recently uncovered piscina and sedilia, comprising four bays of beautiful arcading. A cluster of sketchers and cymagraphers collect material for a complete drawing. A pleasant drive from Dersingham Church brings us to Sandringham House. This is a modern Elizabethan mansion of no particular excellence, and not at all suggestive of a Royal owner. In the grounds is situated the parish church of Sandringham. It has been restored, and somehow or other the charm which invests untouched churches is lost. Loyal members sit down in the Royal pew, and turn over the leaves of the Royal prayer-books, and then go outside to see the grave of the last little Prince. Drive to Castle Rising Church. Pleasant relief from the Rectilinear work of

preceding churches. Here is Transitional work of a very interesting character. Opposite the east end is a quaint brick building, an almshouse founded in the reign of James the First. Inmates wear most peculiar costume, absurd but picturesque. Next to Castle Rising itself. One or two rooms have been modernised, and are now inhabited, but the greater part is a complete ruin. Collection of ornamental tiles found in the neighbourhood inserted over kitchen fireplace. Endless variety of design, geometrical patterns, coats of arms, conventional representations of animals, &c. Gallery of great hall very interesting. One particular cable ornament on an engaged shaft is afterwards discovered in nearly every sketch-book. Fine view from top of castle. Land and sea bathed in sunshine. Drive into Lynn past the picturesque brick tower of the Gray Friars. Dinner and moonlight stroll past the old Flemish-looking Custom-house of the port.

WEDNESDAY.—Leave Lynn at 8.30. Members clustering like bees on the top of omnibuses. Visit the following churches:—**Tilney All Saints:** Fine Curvilinear tower of good ashlar masonry, date about 1340 to 1350. Some interesting Transitional piers in nave. Good roof, with carved angels at ends of hammer beams. No wind braces, which only disturb the eye, and are of no constructional use. West Walton: Tower completely detached to the south of the church. Lancet arcading round tower. Interior of church very beautiful. Glorious Early foliage to capitals, deeply undercut. Piers circular in plan, with four detached shafts of Purbeck marble banded to main pier. Fine geometrical window in south aisle of nave. For illustrations of West Walton Church see Colling's "Details." **Walpole S. Peter:** Capital Rectilinear church, grand effect of exterior. South porch and parvise. Tower Curvilinear, very plain but excellent. Sanctus bell-cot over chancel arch. Altar raised nearly seven feet above floor of nave, owing to the existence of an ancient way at east end of church, which was arched over when chancel was lengthened. Lower part of rood screen still remains, with painted figure decoration upon it. Jacobean font cover. Panelled font. Real lilies bound round it, one in each panel. Delicate perfume and good effect. Idea for sculpture. Oak screens to family chapels. **Walpole S. Andrew:** Rectilinear church, with good piscina. Epitaph in churchyard:—

"Life is a city full of crooked streets;
Death is the market place where all men meet;
If life was a merchant dice that men could buy,
Rich men would ever live and poor men die."

Terrington S. Clement: Tower detached at N.W. corner. Altar raised considerably above floor. Font cover of peculiar construction, with painted decoration inside. **Lynn S. Margaret:** Chancel is of Lancet work particularly solid in character. Nave is modern and barbarous. Stalls in chancel particularly good. Lots of grotesques on brackets and misereres. Fine brass lectern, claws of eagle have disappeared. Two very fine memorial brasses of great size in floor of altar space. **Lynn S. Nicholas:** Peculiar for a remarkable circumstance. The builders of the Lancet period had no sooner finished the west front of their church than they built a tower right against it, thus blocking up their west doorway and the windows above. Floor of old Lancet church several feet below floor of present church, and overflowed at high tide. New spire of timber covered with lead lately added to tower. Cost £1,840, weight 200 tons. General opinion: should have been stone. Eleven-light west window. Cross-like arrangement of central light and tracery. Fine brass lectern similar to that in the sister church. Claws wanting here also. Suggested that they have been of silver, and stolen for their intrinsic value. After dinner walk to the Lady Chapel on the Red Mount. Curious little structure, illustrated in Britton's "Architec-

tural Antiquities." Red brick shell with a kernel of stone, the latter by far the better part. Later on an organ performance for our benefit in S. Margaret's. Sketching goes on by gaslight.

THURSDAY.—Leave Lynn at 8.20 by train for Wisbech. Then by carriage to Elm Church, which possesses good traceried window, and good caps and bases to the piers. From there to Walsoken: Exterior of church mainly Rectilinear. Tower, Lancet below and Curvilinear above. Interior Transitional, but has been restored! Mouldings tooled over and mutilated. General denunciation of all parties concerned. Chancel arch particularly rich in zigzags, &c. Jolly old chest in vestry. Wisbech: Rectilinear church, with two aisles on north side of nave. Lunch at inn, and then drive to Leverington: Square tower with octagonal spire. Octagonal turrets instead of pinnacles at angles of tower at springing of spire. Parvise over south porch has a stone roof in imitation of wood, more curious than beautiful. Fine Rectilinear piscina in S.E. angle of S. choir aisle. Drive from Leverington to Wisbech railway station. Train to Boston *via* Sutton Bridge. Have to wait there an hour and a quarter. Cooling and refreshing drinks largely indulged in. Nothing else to do. Nothing to see. Glad when train comes. Arrive at Boston at 6. Dinner at the Peacock. Then into church for a short time. Dim gaslight, by which the grand interior is seen probably to the best effect, for the sham groining in the aisles, &c., is not noticed in the shade.

FRIDAY.—Leave Boston by train at 8.3. One or two of our number arrive at station just in time to catch train. Have slept in and got no breakfast. Chaff ensues. Leave train at Surfleet station. Carriages waiting for us. Omnibus with postilion in red jacket. Swell turn-out. Drive to Pinchbeck: Rectilinear exterior. Tower having settled during the progress of its building, the effect has been somewhat rectified in the belfry stage, which is almost plumb. An English tower of Pisa! Interior of church peculiar. Has originally been Norman and Transitional, but has been taken down and rebuilt in Rectilinear times. Old materials used again. Strange mixture of detail. Church has been raised in height, the old piers being built upon, so that they are Norman in plan, but of Rectilinear proportions and with Rectilinear caps. Effect of interior much injured by the discordant colours used for decorating (?) the nave piers. Old rector offended at remarks upon them. A few remains of old ancient stained glass. Wish that modern work was like it. Figures in outline almost as if stencilled, and bright colour used sparingly with gemlike effect. Surfleet: Tower very much out of plumb, spire very little, showing that spire has been built after settlement of tower. What faith the builders must have had! Effigy of knight on north side of altar; feet go into chancel wall, a niche being prepared for them. Gosberton: Cross church, with central tower and crocketed spire; wretchedly wiry flying buttresses from pinnacles of tower to sides of spire. Good piers and arcade in chancel. Quadring: Tower walls and buttresses batter considerably, object being to give greater spread to footings. In the Fen Country foundations not good; indeed, it is almost certain that many churches have actually sunk bodily into the ground, in some cases to the extent of two feet. Level altered both on inside and outside, showing that difference is not owing to external accumulation of rubbish. Donington: A church really well restored, tower to south-west, its ground story forming the south porch, projecting from aisle, and therefore in its upper stages quite detached from clerestory of nave, an effective position. Interesting stall division of stone preserved in chancel, date probably about 1220. A cluster of sketchers testifies to its beauty. Bicker: A cross church; nave Transitional; remainder of

church Lancet, except the tower, which is Late Geometrical; nave arcade very rich in zigzags, billet moulds, &c. Swineshead: Some good bench ends collected in south aisle. Boston Church: After dinner the church bells are rung, and many members ascend the tower. Chimes every hour, playing twenty-eight tunes, one for each day of the month. Organ performance in church for our gratification.

SATURDAY.—By train from Boston to Algarkirk station, drive to Sutterton: Nave arcade Transitional, rebuilt in Rectilinear period. Old material used, but fresh details inserted. Pretty Lancet clerestory to north transept. Algarkirk: Church situated in a pretty park; a cross church of much interest, although it has been restored. Quantity of modern stained glass; quality would have been better. Kirton: Bad effect in chancel from the use of dark mortar. Should always be of the same colour as the stone. Fine Curvilinear windows in the south aisle. Rectilinear panelled font. Three doorways into nave. The south and west of these exhibit Transitional and Geometrical mouldings mixed up together, showing that the previously existing doorways have been taken down and rebuilt in Geometrical times; or it may be that the stones of the Transitional chancel arch were utilised in the construction of these doorways. The north doorway into the nave is Geometrical throughout. Frampton: Beautiful Lancet tower and very fine octagonal broach spire, with three tiers of spire lights on cardinal faces only. From the diagonal buttress at the south-east angle of the south transept projects a sculptured head with an inscription above, deciphered as follows:—"Wot ye whi I stond her for? I forswormy fath. Ego Ricardus in Angulo." Return to Boston: To the church to hear Mr. Sharpe's remarks upon it. Finest example of a parish church in England. Nave of seven bays with side aisles. Curvilinear throughout. Good stall work in chancel, with grotesques and miseres. The tower, or "Boston stump," has been so often illustrated that it needs no description. Final dinner at the Peacock. Vote of thanks to Mr. Sharpe. Health to our chaplain, our reverend friend of a year before; and then good-bye. South, west, and north go the excursionists, well satisfied with their week's holiday, and better for it in body and mind. May we meet again another year!

REPORT OF THE METROPOLITAN BOARD OF WORKS FOR 1870-71.

YEAR by year the reports of the Metropolitan Board of Works record in an unpretending manner the progress which has during the last sixteen years marked the government of the metropolis in matters appertaining to the jurisdiction of the Board.

Standing on the Victoria Embankment, now fast approaching completion, with the river partially cleansed rolling past a stately quay, as such a noble river should, and not creeping like some loathsome thing in and out pestiferous creeks, amid reeking, slime-covered, slowly-rotting barges; and at one's back, masking the ugly remains of wharfs and warehouses, a fair garden gaily set out with flowers and shrubs, one cannot but feel grateful to the Metropolitan Board for what it has done, though, in true English fashion, it may have taken a long while to do it. We need not recapitulate the particulars of the construction of the works further than to remind every one that 37½ acres have been reclaimed from the river, of which 19 acres are occupied by carriage and footways; 7½ acres have been appropriated by the Crown, the Societies of the Temple, and other adjacent landowners; and the remaining 8 acres of which are devoted to the public use as ornamental grounds.

It is not every yearly report that can chronicle the completion of such a piece of work, yet the record of the past year bears witness to an aggregate of work in other directions of considerable importance. With the exception of a short piece near Blackfriars-bridge in connection with the Fleet outlet, and the portion between Chelsea-bridge and Cremorne pumping station, the whole of the Northern Low Level Sewer is completed. At a

cost of £13,000 the Abbey Mills pumping has been rendered more thoroughly efficient by arrangements for working the engines in pairs, and the necessary work of covering, reconstructing, and straightening the old main lines of sewers has been proceeded with as rapidly as possible. The Albert Embankment, completed more than a year and a half ago, is, like the Victoria Embankment, to be ornamented by planting the spare plots of ground with trees and flowers; the construction of the Chelsea Embankment, which will complete the northern river line of thoroughfare from Chelsea Hospital to Battersea-bridge, has also been commenced.

Among street improvements the further progress of Queen Victoria-street towards completion must be mentioned. All of it is finished with the exception of about 500ft. of roadway from Peter's-hill to New Earl street. The Park-lane improvement, which consists in the widening of Hamilton-place, and opening its northern end into Park-lane, has also been completed. In the preservation of open commons and spaces, the Board have during the past year concluded a very satisfactory arrangement for the acquisition of Hampstead Heath. The obstinacy which characterised the late Sir T. M. Wilson was fortunately not found in his successor, Sir J. M. Wilson, who has met the Board in a fair and business-like manner, thus enabling them to settle a very old grievance. The Heath is to become the property of the Board for a sum of £4,700, inclusive of all charges except such compensations as the Board may have to pay to copyholders. An equal measure of success cannot, unfortunately, be recorded as having attended similar efforts on the part of the Board with respect to Epping Forest.

DUTIES OF PARISH AUDITORS.

IT is frequently imagined that the duty of an Auditor is simply to cast up a series of cash columns, and see that the totals of each are correctly transferred. But such is not the view, says *Horne's Monthly Circular*, taken by the Metropolitan Local Management Act. This Act provides that the Auditors of the Accounts of the Metropolitan Board of Works, District Boards and Vestries, shall, on a day in the month of May, to be fixed by the Auditors, attend at the various principal offices of such Boards and Vestries, and the Clerks, Treasurers, and other officers of such Boards and Vestries shall produce and lay before such Auditors, at every such audit, their accounts for the year preceding, and also a full statement and account of all contracts, moneys received and expended, during the preceding year, up to 25th March of the then present year, properly arranged under heads of receipt and expenditure, and also all arrears of rates, and moneys owing to, and mortgages, debts, and liabilities owing by such Boards and Vestries respectively; with vouchers, books, papers, instruments, and writings in their custody or control, relating to such moneys, &c. The Auditor has power, in the presence of any ratepayers who may desire to attend, to examine any members of the Boards or Vestries, and to summon them for that purpose to attend, touching the said accounts, and to hear any complaint of any ratepayer or creditor respecting such accounts, and to examine, allow, or disallow the accounts, and to charge in such accounts all sums which ought to be, but are not accounted for or brought into account, and if such accounts be found correct, but not otherwise, the Auditor or majority of Auditors shall sign the same. It is, therefore, evident that the Auditor is the chief check upon parochial expenditure, and ratepayers should see that he does his duty. At a time when in some parishes the rates and taxes amount to 40 per cent. upon the rental, it is desirable the ratepayers should attend and see how the money they pay in rates is appropriated. Till ratepayers take a more personal interest in parochial management very slight will be the chance of reducing expenditure.

THE COURTS AT THE OLD BAILEY.—Mr. Commissioner Kerr, a day or two since, took occasion to complain of the condition of the courts in the Old Bailey, and drew attention to the fact that he and the jury, and indeed, every one concerned, had to submit either to be oppressed with heat, or, in the event of the windows being opened, to be absolutely deafened by the noise of the carriage traffic outside, making it impossible in the latter case to hear the statements of the witnesses or the accused. He added that a few months ago he protested against a sum of £900 being spent upon the courts without any enlargement or improvement being made, and that he thought it disgraceful that jurymen and witnesses in waiting had no sufficient accommodation, and had mostly to hang about public-houses in the neighbourhood.

DESIGN FOR WINCHESTER TOWN HALL.

A SHORT time since (BUILDING NEWS, No. 854) we gave an illustration of the premiated design for the Winchester Town Hall, and we now present our readers with a double page illustration of a design submitted for the same building by Mr. Edward W. Godwin. All who are concerned in competitions and the comparative merits of selected and rejected designs will no doubt compare these with interest.

The main endeavour of the architect in his design was to mass the buildings required well together, so as to cover as little of the site as possible, the sum mentioned in the instructions to the competing architects having rendered this method of treatment absolutely imperative. The low level of the site, the immediate proximity of lofty buildings, and the by-no-means distant College and Cathedral, necessitated a recourse to height, in order to secure the dignity due to a Guildhall of a city like Winchester. To have done this, however, by a solid tower would have been too costly, and as a civic or domestic character should be given to the tower, so that in the distance it might not be mistaken for a church steeple, it was deemed advisable to design the upper portion of the tower mostly as of timber-framing covered with lead.

The principal feature of the internal design is the inner lobby and grand staircase leading therefrom to the council chamber. Here Mr. Godwin contemplated the employment of stained glass, vaulted roofs, and historical wall paintings, representing such scenes as the grant of Henry II., in 1184; that of John in 1208; the reconciliation of the town and King by Queen Margaret; and the examination of the Mint Masters by Henry I. in the Christmas of 1125. These might have impressed the visitor with due reverence for the historical greatness of the chamber he was approaching, in the ante-room to which he would read of those Winchester worthies who for nearly seven centuries from the time of Florence de Lunu had filled the office of chief magistrate.

As an archaeologist, the author of this design must have felt more than a mere business interest in this competition. The building of a Town Hall for a city like Winchester could not but engage the earnest attention of any architect. Mr. Godwin's regret at the rejection of his design we can believe and share.

AN AMERICAN VIEW OF PATENT LAWS.

THE Hon. Chas. Mason, an Ex-Commissioner of Patents, has written Mr. Geo. Haseltine, in this country, an instructive letter on the subject, an abstract of which we append:—I have, he says, never had any serious doubt of the wisdom of a judicious system of patent laws. The public welfare is best promoted by inspiring individual effort in respect to invention, through the motive of private gain; and who can more justly claim the exclusive use of any property than he who has brought it into being?—The American system of examination is productive of much advantage to inventors and the public, but I doubt the wisdom of lodging in officials an unlimited power of rejection. If the duties of examiners were advisory and adjuvant, reserving to an applicant the ultimate right to a patent, at his own risk, the chief objection to this system would be removed.—The fees by all means should be small—barely sufficient to defray the expenses of the Patent Office. Inventors are benefactors, and as a class poorly compensated for their labour. The imposition of large fees discourages invention, and thereby checks the progress of civilisation. This cannot be sound policy.—Experience leads me to the conclusion that patents should be granted for more than fourteen years, but this term, in most cases of merit, is extended by our office to twenty-one, and often by Congress to twenty-eight years. The new law limits the term of a patent to seventeen years, which will, no doubt, hereafter be extended; and I do not think twenty-one years too long a period for the original grant.—In one respect I like your system better than ours—your fees are paid in instalments, giving the patentee the option of keeping his patent alive. The French plan of annuities is carrying the matter rather too far. I think the English system better than the French or the American, and all that is needed is a reduced rate of fees.—Experts are often very useful, but they are regarded with suspicion, and their opinions have little weight in our courts, therefore what might be a great evil carries in some measure its own remedy, and the interposition of jurors in patent suits is generally avoided by obtaining injunctions in Chancery, which is our usual remedy for infringements.

LONDON INTERNATIONAL EXHIBITION OF 1872.

HER MAJESTY'S Commissioners for the Exhibition of 1872 announce that the second of the Series of Annual International Exhibitions of Selected Works of Fine Art (including Music), Industrial Art, and Recent Scientific Inventions and Discoveries, will be opened at South Kensington, London, on Wednesday, the 1st May, 1872, and closed on Monday, the 30th September, 1872.

These exhibitions will take place in the permanent buildings erected for the purpose, adjoining the Royal Horticultural Gardens, and in the Royal Albert Hall. Each annual exhibition will consist of three divisions, viz.: (1) Fine Arts; (2) Manufactures; (3) Recent Scientific Inventions and New Discoveries. Divisions I. and III. will form part of each annual exhibition. The classes of manufactures included in Division II. will vary from year to year.

The productions of all nations will be admitted, subject to their approval by competent judges as being of sufficient excellence to be worthy of exhibition, and provided they have not been exhibited in the previous International Exhibition.

The Exhibition of 1872 will consist of the following classes. For each class a separate committee of selection will be appointed:—

DIVISION I.—FINE ARTS.

Fine Arts Applied or not Applied to Works of Utility Executed Since 1862.

Class 1.—Painting of all kinds, in oil, water colours, distemper, wax, enamel, and on glass, porcelain, mosaics, &c.

Class 2.—Sculpture, Modelling, Carving, and Chasing in marble, stone, wood, terra-cotta, metal, ivory, glass, precious stones, and any other materials.

Class 3.—Engraving; Lithography; Photography, as a fine art, executed in the preceding twelve months.

Class 4.—Architectural Designs and Drawings, Photographs of executed buildings, studies or restorations of existing buildings and models.

Class 5.—Tapestries, Carpets, Embroideries, Shawls, Lace, &c., shown not as manufactures, but for the fine art of their design in form or colour.

Class 6.—Designs for all kinds of Decorative Manufactures.

Class 7.—Reproductions—i. e., exact copies of Ancient or Mediaeval pictures painted before A.D. 1550. Reproductions of mosaics and enamels; copies in plaster and brittle ivory. Electrotyps of ancient works of art, &c.

DIVISION II.—MANUFACTURES.

Class 8.—Cotton and Cotton Fabrics.

Class 9.—Jewellery—i. e., articles worn as personal ornaments made of precious metals, precious stones, or their imitations, but not goldsmiths' and silversmiths' work, which will be exhibited in 1876, or watches, which will be exhibited in 1875.

Class 10.—Musical Instruments of all kinds.

Class 11.—Acoustic Apparatus and Experiments.

Class 12.—Paper, Stationery, and Printing:—(a) Paper, card, and millboard; (b) stationery, account books, &c.; (c) letterpress, plate, and all other modes of printing.

Raw Materials, Machinery, and Processes used in the production of all the several classes of manufactures mentioned above.

Detailed rules and lists of the separate trades engaged in the production of objects of manufacture will be issued.

DIVISION III.—RECENT SCIENTIFIC INVENTIONS AND NEW DISCOVERIES OF ALL KINDS.

All objects submitted for this Exhibition must have been produced since 1862. In the divisions of Manufactures and Recent Scientific Inventions and Discoveries producers can send only one specimen of each kind of object they produce, such objects being distinguished by novelty or excellence. The arrangement of the objects will be strictly according to classes, and not, as in former International Exhibitions, according to nationalities. Foreign governments which desire to have space guaranteed for special and selected objects can obtain such a guarantee upon making application before the 1st October, 1871. (See special rules.) Objects produced in the United Kingdom, as well as those objects produced in foreign countries, for which space has not been guaranteed, must be sent direct to the building for the inspection and approval of judges appointed for the purpose. All objects must be delivered at the proper places in the building, which will be hereafter advertised, and into the care of the appointed officers, free of all charges for carriage, &c., unpacked, labelled, and ready for immediate exhibition. No rent will be charged for space. Her Majesty's Commissioners will provide glass cases, stands, and fittings, steam and water power, and general shafting, free of cost to the exhibitors, if their requirements in these respects be notified to Her Majesty's Commissioners before the 1st January, 1872, and the Commissioners will carry out the arrangement of the objects by their own officers, except in regard to machinery, and to any special cases requiring skilled assistance, which must be provided by the exhibitor. Her Majesty's Commissioners will take the greatest possible care of all objects, but they will not hold them-

selves responsible for loss or damage of any kind. Prices should be attached to all works of art, and retail prices to all other objects intended for sale at the close of the Exhibition. Agents will be appointed to attend to the interests of exhibitors. Every object belonging to Divisions II. and III. must be accompanied by a label, stating the name and address of the exhibitor, the special reasons (such as excellence, novelty, cheapness, &c.) why it is offered for exhibition, and the retail price at which the public can obtain it.

The days appointed for receiving each class of objects are as follows:—

On Friday, March 1st.—Machinery and raw material.
On Saturday, March 2nd.—Recent scientific inventions and discoveries.

On Monday, March 4th.—Cotton.

On Tuesday, March 5th.—Acoustic apparatus.

On Wednesday, March 6th.—Paper, stationery, and printing.

On Thursday, March 7th.—Painting in oil and in water colours.

On Friday, March 8th.—Painting in oil and in water colours.

On Saturday, March 9th.—Reproductions of pictures, mosaics, enamels, &c.

On Monday, March 11th.—Architectural designs, drawings, and models.

On Tuesday, March 12th.—Tapestries, carpets, embroideries, &c.

On Wednesday, March 13th.—Engraving, lithography, photography, as fine arts.

On Thursday, March 14th.—Designs for all kinds of decorative manufactures.

On Friday, March 15th.—Furniture and all decorative works.

On Monday, March 18th.—Stained glass.

On Monday, March 20th.—Musical instruments.

On Wednesday, March 27th.—Sculpture.

On Tuesday, April 9th.—Jewellery, which must be brought in small cases, to be previously obtained from the Commissioners.

Prizes will not be awarded, but a certificate of his having obtained the distinction of admission to the Exhibition will be given to each exhibitor.

The present rules apply to the Exhibition of 1872, and are subject to revision in future years. All persons contributing to these exhibitions shall be considered thereby to render themselves subject to such rules and regulations as Her Majesty's Commissioners may, from time to time, lay down for the conduct of these exhibitions.

MUSICAL ARRANGEMENTS.—Her Majesty's Commissioners will appoint a committee to select, for performance in the Royal Albert Hall, new compositions of merit which may have been published before the 1st March, 1872.

SUPPLEMENTARY COURTS.—Foreign Governments may also erect, subject to the regulations laid down by Her Majesty's Commissioners, supplementary buildings, with the object of giving additional space to the exhibitors selected for admission into the Annual International Exhibitions, but these buildings are only to be used for the display of objects corresponding with those prescribed for each particular year.

THE ALBERT BRIDGE

CONSIDERING the length of time this much-needed bridge has been in a state of almost complete abeyance, the public will, no doubt, be a little surprised to hear that there is now a continuous platform of timber right across the river. This will serve as the temporary staging and working roadway during the construction of the permanent bridge. Whatever may have been the inactivity and neglect of those who formerly had to do with the project, it has been more than compensated for by the energy and vigour displayed under the new régime. It is scarcely six weeks since the contractor, Mr. Williamson, set to work to alter, repair, and greatly extend the existing staging and timbering, so as to adapt it to the different features of the new design. Under the able management of Mr. F. W. Bryant, C.E., of Blackfriars-bridge celebrity, the works are now fairly started, and will be pushed on as rapidly as possible. The east iron cylinders will soon be ready for sinking, and in a short time the permanent structure will begin to give visible signs of its existence. A small party, consisting of the directors of the undertaking, the engineers, the contractor, and some visitors, met on the temporary bridge, on Monday last, and drank success to the project in a social glass of good wine.

A CHURCH STRUCK BY LIGHTNING.—A violent thunderstorm passed over Stone, in Staffordshire, and the locality on Wednesday week. Just as the church clock had struck seven the tower of the parish church was struck, and one of the four vanes with its iron supporter, blown from the pinnacle, which was shattered. The lead roof of the church was penetrated by a portion of the falling pinnacle.

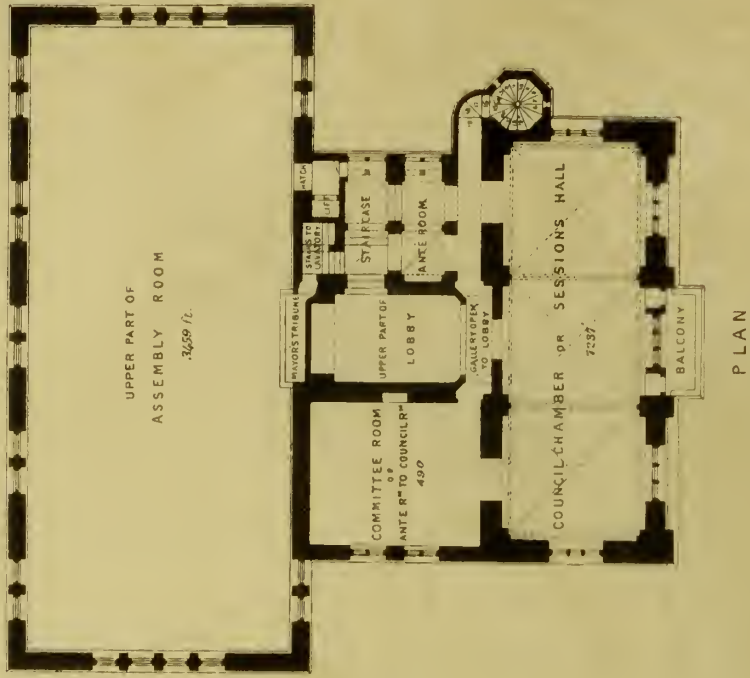
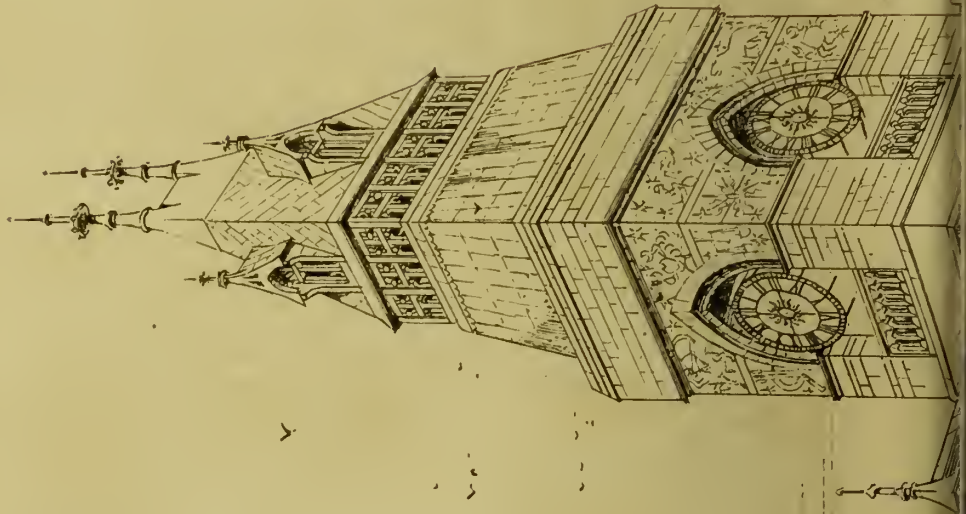




Photo-Lithographed by Whiteman & Bosa London

DESIGN FOR TOWN HALL, WINCHESTER.

E. W. GODWIN, ARCHITECT.

NOTES ON CARPENTRY AND ON STRAINS IN STRUCTURES.—V.

IN the framing of gates how much bad work we see! Sometimes the bars are not braced at all, and often imperfectly; the foot of the brace, for instance, resting on the lower bar and its head abutting on the head-post, by which contrivance the weight of the gate is brought to bear in the most effectual way to drive the head-post off the tenon of the top bar, and at the same time the weight of the gate is made to cause a cross strain on the tenon of the bottom bar.

The proper way to frame a gate is to cut a shoulder in the heel-post a little above the bottom bar, mortise it for the tenon of the brace, and cut a similar shoulder and mortice on the underside of the top bar, in the centre of it, at a distance from the head-post of about, but not exceeding, one-third of the length of the gate. Lay the common bars alongside, and let them into the head and heel posts to their full depth of $\frac{3}{4}$ in., and strongly nail them to. Stiffen them by two vertical battens, 3 in. by $\frac{3}{4}$ in., placed on the opposite side of the gate. Hang the gate to a firm post, and set up a sufficient clap-post, and you will have erected a gate that will stand up to its work.

The frame, that is the top bar, the heel-post, and the brace, should be of hard wood; the rest may be fir, and will be better of fir than hard wood, because it will be lighter. The mortices in the top bar and in the heel-post should be $\frac{3}{4}$ in. wide. The gate must be held firmly back to the main post by a long strap clasping the end of the top bar, and the bolt by which the gate hangs to the post must pass through it, and be secured at the back. The hooked staple upon which the gate rests at the bottom must have a large shoulder to prevent its being driven further into the post.

The framing of lock gates or of pointing gates for drainage works has peculiarities requiring the nicest adjustment of work, as all work does where water has to be contended with. The following is a description of a pair framed under the present writer's inspection, and the notes made at the time are to the following effect:—We had the timber, English oak, sawn $\frac{1}{2}$ in. wider each way than the finished dimensions, to allow for planing and squaring up. When it was ready to be wrought and framed, two large timbers were laid along the ground (the width apart being the length of the gate to be framed), and the bars were got on to them and planed on one side, across the grain. A winding strip of deal, about 4 in. by $\frac{3}{4}$ in., 2 ft. long, was then placed at each end, and the ends planed down until the strips were out of winding. The middle part was then planed over crosswise, until the whole was out of winding. The inside of the piece, or that side which had to come next the pointing sill, was straightened first, which served to gauge the other dimensions from: and the other sides having been planed up to the proper dimensions, the tenons of the bars were marked with a gauge of the form shown in fig. 23.

The length of the bar from shoulder to shoulder being then marked, leaving $\frac{1}{2}$ in. too long at each end for scribing up, the tenons were cut to the proper length, and as each bar was finished it was placed further along the gantry and covered up from the sun and weather, otherwise they would have been warped and twisted so that they could not have been accurately put together. The mitre posts and the heel posts were next worked, and the mortices gauged with the same gauge that had been used for the bars. Both mitre and heel posts were left square until the gates had been put together.

The bars then being laid in position, with the planking side downwards, the mitre and heel posts were brought to their places, and knocked on to the tenons of the bars with wood mells (mauls) as far as they would go. Four rods of $\frac{1}{2}$ in. iron, screwed at each end,

were then laid across, two at each side of the gate, and packings having been put in between the washers and the heel and mitre posts, they were screwed up close, and the width between the mitre and heel posts having been adjusted so that it was the same at both ends, $\frac{1}{2}$ in. was gauged off from them on the ends of the bars, which were cut off to that line as soon as the heel and mitre posts had been taken off.

FIG. 19

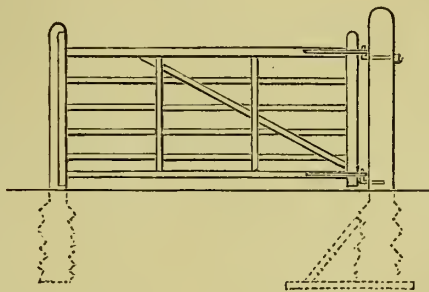


FIG. 20

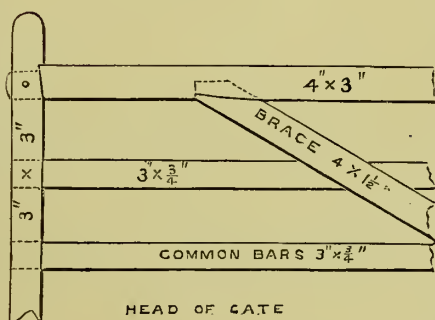
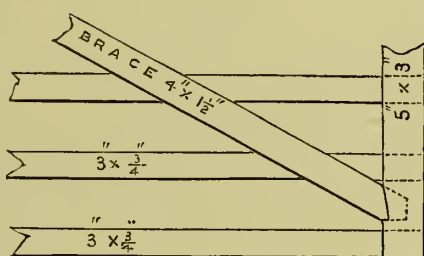
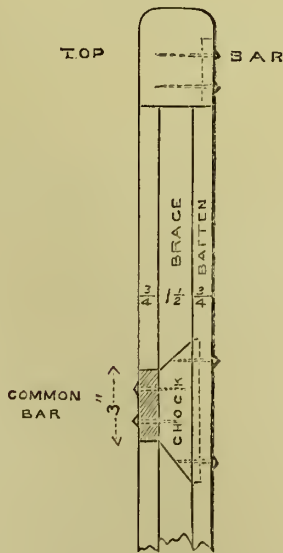


FIG. 21



HEEL OF GATE

FIG. 22

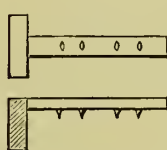


covered with a coat of oil of creosote, and when dry, which was in about an hour, another coat was put on. The heel-post was then rounded off, first by taking off the two arises, then the remaining four, and so on, until the heel of the gate had been brought perfectly true to a mould. The edges of the middle bars on the face side were then chamfered off. All the bars and the mitre and heel-posts were now turned over, with the planking side upwards, and the screw put on again, and the whole screwed tightly up. Draw-bar pins of oak 1 in. diameter, were then driven into augur holes previously bored through the mitre and heel posts, and through the tenons of the bars, two holes in each tenon. The holes in the tenons being bored a little short of those in the heel and mitre posts, the pins drew up the bars still tighter, or at least, prevented them giving way after the screws were removed.

The rebates were now cleaned out at the corners, and the planking, which was 2 in. thick, cut to the proper length and shot straight on the edges. A mixture of cow-hair and Archangel tar was now made. The hair, being in lumps, had to be beaten out until quite free, and about a handful was put into about two quarts of tar. The mixture was then spread over the seat of the planking. The planks were covered on the edges with white lead and oil, or stiff white paint, and laid in their places (being first creosoted on the under side), and when three planks in width had been laid down they were wedged up close by double wedges and then spiked down with 5 in. deck spikes.

The notes of another pair of gates are as follow:—The top and bottom bars, and the mitre and heel posts, were of African oak; the middle bars of Memel fir. The tenons of the bars were smeared with Stockholm tar to make them slip into the mortices better, and to keep out the water. The planking was bedded on the bars with felt, soaked in boiling tar, or the tar was put on to the bars and the felt laid on it, and when the planking was spiked down it squeezed out the surplus tar

FIG. 23



and made a very solid bed. The joints of the planking were caulked with oakum, the planking was first close jointed and then the joints were rimed out on the upper side, but not quite to the full depth of the planking. A thread of white oakum was then caulked in and two threads of black on the top of it. When the gates were put into the water the planking swelled and quite buried the oakum in the heart of the joint. All the castings and other ironwork were bedded on flannel and white and red lead, mixed. The gates were payed over with, first, a coat of oil of vitriol and fish oil, in the proportion of about one of vitriol to 10 or 12 of fish oil. The second coat consisted of the first mixture, with the addition of a little Stockholm tar. Third coat, more tar mixed with former mixture. Fourth coat, more tar still, and the last coat consisted of tar and pitch.

The pointing sills were bedded on the apron on white and red lead, mixed. The apron was formed by laying a floor of timbers 15 in. square and 15 in. apart in the clear, across which were laid timbers 13 in. square, laid close, upon which was laid close planking 3 in. thick, upon and across which was laid another tier of planking 3 in. thick, and upon this the pointing sills were bedded.

NEW SCIENCE SCHOOL, SOUTHAMPTON.—Some time ago we referred to the new school of art here. Another addition to the Hartley Institution (which will be a prominent establishment for the use of students for the Indian Engineering and Telegraphic services) is about to be made, the designs being prepared by the borough engineer, Mr. Lemon. There are some features worthy of notice in the construction of the proposed building to which we may call the attention of our readers.

The T plates and L plates were then let into the gates on the face side, so as to be flush with it, and after being marked with a prick punch, corresponding with the same marks on the gates, they were removed and the holes punched. The gates were then

REPORT ON FURNITURE AND METAL WORK IN THE INTERNATIONAL EXHIBITION OF 1871.*

(Concluded from page 125.)

OF furniture, illustrative of French marquetry, we may point to a table by Messrs. Jackson & Graham, and to an oval table (in the English Picture Gallery), rewarded by the Society of Arts. The first is in Amboyna wood; round the edge are delicate borders of hare wood (gray), palm cut on the cross, holly, ebony, and various other woods. A cabinet, mounted with chiselled gilt metal work, in the manner of Gouttière, is also exhibited by Wertheimer. (No. 3092.) Other improvements in furnishing took effect during this period. The discoveries of Herculaneum and Pompeii revived a feeling for the Classic; and the extravagant carvings and sprawling lines of gilt wood-work gave place to the clean-cut, careful flower-work we now call Louis Seize work.

We may point to a console table, carved for gilding, in soft wood, exhibited by a Dutch maker, in the Furniture Tower, as an illustration of this kind of work. Panelling and room fittings of all kinds were carved in France at that period in this elegant fashion. The French carving, however, of the late eighteenth century lacked the full sweep and grace of the Italian natural designs, and the same may be said of the carving of our own country.

A great impression was made on the furniture, as upon the architecture of his day, by Sir William Chambers, the architect of Somerset House; and still more during the "Louis Seize period" by the Brothers Adam, well-known architects and designers.

John Baptist Cipriani was brought over to England, and became a great designer of decorative wall painting, and in painting panels and ornaments of various kinds on furniture. Satin-wood, a beautiful amber-coloured grain, taking a fine polish, was veneered on mahogany and other woods, and decorated with little panels in camaieu (two colours, like a cameo sculpture), or borders of peacocks' tails, &c., painted by him and by Angelica Kauffman, a Swiss artist, on the surface. Examples are quoted farther on.

Good marquetry, in woods generally light and delicate in hue, was made during the last century in England. The workmanship of these old pieces is admirable.

Early in the present century, we find that the French expedition to the East, and the Italian campaigns, together with the establishment of the Empire, brought about a fresh Classical revival in France in furniture, metal-work—even in the draperies of costume. Sphinx and lion heads and claws were carved on the arms and supports of chairs and tables. In our own country we find the dining-room furniture made in mahogany, constantly following designs from vases; some very good and appropriate, such, perhaps, as could hardly be bettered for useful and judicious construction, and models of the legs of "trapezophora," or lion supports of tables and brackets found in the excavations of Italy. Collectors like Sir William Hamilton, and the members generally of the Dilettanti Society, went far in giving a Classic turn to this taste in furniture.

One great change took place in the public taste about 1820—viz., the revived taste for Gothic art. Not only was Mediæval architecture revived and studied under various influential masters, but furniture was specially designed to meet the newly-developed taste. The work had begun before Mr. Pugin's palmy days. Many sumptuous houses were built and furnished before Mediæval principles of construction and decoration were half understood. Both in solid furniture, metal-work, room-paper—in short, every form of interior decoration—Mr. Pugin exercised a wide and a lasting influence. Light, well-made pieces of furniture were turned out from Mr. Crace's establishment and elsewhere, not to speak of the wood-work of the Houses of Parliament, which owed much to Mr. Pugin's publications on Mediæval art. This taste has been variously modified since. We may notice, however, that while several examples of such furniture found their way into the Great Exhibition of 1851 and subsequent gatherings, this taste is scarcely represented this year. Furniture being a kind of extra, and one of the forms in which art has been allied with manufacture, we are not entitled to conclude more than that no sumptuous or carefully-decorated furniture of this kind, except the doors already noticed, has been turned out worth sending in.

* By J. HUNGERFORD POLLEN, Esq., M.A. From the Official Reports. Printed and published by J. M. Johnson & Sons, 3, Castle-street, Holborn.

Happily, the resources of furniture invention are by no means exhausted, and we cannot but view the novel contributions of this kind with real interest and satisfaction. Not only do we see admirable work, more or less illustrative of the Quattro-cento and Cinque-cento periods which, full of inventiveness, we have tried to view in connection therewith, but there are several applications of simple principles so new that we must speak of them as modern inventions.

Under the learned term Xylotechnography, we have, from the workshops of Messrs. Trollope, and designed by Mr. A. F. Brophy (3084, 3085, 3086), cabinets and wardrobes made of stained wood. In the case of the employment of many colours the base of this work is pine-wood; and where black and white alone are used, it is sycamore—a white wood. The portions that are to be left white, or the original hue of the wood, are prepared so as to resist the action of the stains put on. As the light stains are added these parts are also covered for the same purpose. By the time the darkest stain has been applied these darkest portions have been steeped in all the stains previously used.

It is to be noticed that by this process the dyes sink deep into the wood, while the undyed, or delicately-dyed portions are preserved by stopping from any further action of the deeper tints than just the shades required.

There are more than one resuscitation of the satin-wood furniture that was in fashion during the last fifteen or twenty years of the last century. In this description of furniture, borders, medallion figures, &c., are painted on the bare wood. The whole is then French-polished over. There is a cabinet of this material (No. 3091), with quaint, bevelled glass panels, and spirited little painted panels of mythological figures. Some of these examples exhibited are painted in water-colour, polished over in the same way, and proof against the action of water in consequence.

We notice, in No. 3094, ivory inlaid into satin-wood, and engraved, looking, at first sight, like white painted decoration; as also Hungarian ash, inlaid with the gray hawewood, and with plaques of Wedgwood gray and white cameo ware.

In the lower corridor a large application to furniture of the Viennese coloured and inlaid morocco leather work should be noted. It forms a sort of cabinet, or great chest, on a stand of gilt wood-work. We only regret the readiness with which work so delicate and tasteful would get soiled and dull, without, we fear, being easily cleaned.

We must point out the leather and other chairs of Ingledew (some seen in 1867, at Paris); others by Collinson & Lock, and Jackson & Graham.

There are skilful pieces of carved wood, not belonging to furniture at all (3087), by Rogers; a frame (3080), by D. Dolce; a group in limewood of a pheasant and foliage, by Wallis. These more or less aim at the perfect representation of Nature in soft wood, carried to perfection in the seventeenth century by Grinling Gibbons and his pupils; and some wood carving for clock-stands, &c., from Baden, should be specially noted.

We prefer to notice separately the Oriental productions, mostly exhibited by the Indian Government, which are some of them of such beauty that they form an exhibition worth studying by themselves.

Of wood sculpture in the form of furniture we have but few specimens. We see, however, for the first time Scinde painting and Cashmere painting, full of its Persian feeling, applied to furniture. The chair of Hyderabad work, and the other pieces from Cashmere, are covered with excellent decorative painting, foliage, and shawl-pattern work. In the form of door panels, &c., which might be prepared in India and fitted here in England, such a method of decoration opens out to us entirely new sources of house furniture. It will require great judgment and a real artistic taste to avoid making a vulgar use of such material; but there are definable limits within which this work would be of great service.

Another method of painting wood-work should be noticed in the Scinde productions of the turning lathe. All shades of agreeable hues of red, green, yellow, &c., are used in this decoration, ingeniously broken by some handy knack of casting on other colours. The result is akin to that of marbling paper by the bookbinder. In that process oil-colour is flicked on the surface of water; one colour after another. It is waved, or curled like the grain of marble, by the handiness of the workman, and taken up by applying the paper to the surface. In the case of this wood-work the rapid action of the lathe either breaks the second colour or causes it to fall with the required regularity on the wood-work and no more. Some curious wooden cups, painted in a simple manner in the lathe, from Khotia, are

worth notice. They are exhibited along with vases of earthenware, coloured like the cups.

The Bombay wood-work is of various kinds. The most modern invention from Bombay are the chairs and tables of pierced work, elaborately carved in hard wood. It is an attempt to adapt to modern European forms a laborious manufacture suited for different purposes. The chairs are not comfortable and the tables in the least useful form. The small Bombay work, inlaid and carved in sandal-wood, is both national and admirably adapted for the sort of wares made from it. The inlaid work is arranged in circles, borders, or stars of minute pieces, in geometrical form; generally combinations of the triangle. The ivory, ebony, metal, &c., are cut in fine strips and glued into long sticks. These are cut in slices, and each slice shows the pentagon, circle, or other form composed of triangular dies of ivory, white and stained, ebony, tin, &c. It can then be veneered in the usual way; or as is more usual, inlaid into the solid sandal-wood. This art dates from a remote period. It is derived, according to the learned Dr. Birdwood, from Persia. The sandal-wood carving is executed at Bombay and Mysore. The work from Mysore is rather larger, more artistic, and freer in the use of figures than that from Bombay. It is better suited for small ware, panels, &c., than for expansion into articles of actual furniture.

We must not conclude these few remarks on Oriental furniture without noticing the cabinet exhibited by Sir R. Alcock, from Japan (English Gallery). The whole decoration is in varied applications of stained straw fibre. The polished surface of the straw, stained to a fuller colour, if, indeed, the straw is not of its natural yellow, chosen from kinds grown in Japan, has in decoration the value of gold. The trees, birds, carts, &c., are quaintly but artistically placed on this splendid field. The small fittings of the upper part and the chased silver mounts, will remind the visitor of those fine productions in small ware in the manufacture of which the Japanese are artists with special traditions, but without rivals.

The Japanese combine what we have scarcely known since the great days of European art—the artist, handicraftsman, and workman in one; with secrets of metallurgy, gilding, and lac-varnishing in a number of mysterious ways, of which we know but the surfaces.

There is a piece of Chinese sculpture, partly wood and mostly ivory, an elephant's tusk of unusual size, mounted in ebony, which should be studied, to show that Chinese carving, though not as good as in times past, is active still. These are solitary, or all but solitary, examples of Japanese and Chinese wood-work, which can be more fully studied in the South Kensington Galleries; particularly to the remarkable contributions to the Loan exhibition of the Museum.

And with these remarks we must bring to an end our notices of furniture and wood-work. Though not numerous, the contributions of this year are so varied, and the number of novelties so considerable, as to be suggestive of changes or developments more than proportionate to the modesty of the present display. We pass to

Metal Work.

The early nations of the East were familiar with mixed metals before they acquired the use of iron and steel. The Greeks had famous schools of sculptors in mixed metals at Egina, Delos, and Corinth. The general metal in use was an amalgam of copper and tin, known as bronze or brass. Other metals in small quantities were added, differently in different schools, and resulted in bronzes slightly differing in hue and in temper. The great statues of antiquity, which we now know in the form of marble copies, made by late Greek artists, were originally executed in bronze.

In studying many of the examples exhibited this year, we are brought face to face with some of the oldest forms and methods of metal work known. The art of working in metal, as every one knows, is coeval with history. The very earliest historical records we have mention or allude to metallurgy in gold, silver, and brass.

The Romans brought the use of this metal for sculpture, armour, and arms, into Gaul and into our own country. Admirable shields and weapons, made by our rude ancestors during or subsequent to the Roman occupation, are in existence in our museums.

This ancient amalgam was revived and used with great effect by the sculptors of the Cinque-cento, or Renaissance period, in Italy. Donatello, Ghiberti, Verocchio, Michael Angelo, and a number of great artists brought in the use of bronzes, in various degrees of toughness, and of varieties of colours, according as white metals or copper predominated,

into Italy. A school of sculptors in small works of bronze has continued in that country to our own day. In France, and in our own country, bronze was used by artists for small work, and in our own times (upon occasions) for colossal public monuments. In this report we are mainly concerned with metals as used for decorative work; and the use of bronze for mounts or finishings of furniture, carriages, harness, and various articles of hardware. The fine metal edgings so delicately cut and chased, which were used in the cabinets and commodes of the Louis Seize period, and during the corresponding period in England, and on clocks, &c., were made of mixtures of bronze. The mounts on Messrs. Wertheimer's furniture, and a console table of steel and bronze, are examples.

The French use bronze for an infinite variety of small artistic objects, especially decorated utensils, such as lamps, candlesticks, &c. The house of Barbédienne is at the head of this production; that of Denière and others make similar works. In the French Annexe a large assortment has been received from both these enterprising firms.

Though made as a manufacture in large quantities, it must not be supposed that this work is artistic. The best modellers in France are employed on the designs; in return, the enterprising manufacturers reap the custom of the world.

Brass, an amalgam of copper and zinc, takes the place of bronze in England. The metal is more easily worked in the lathe, and more valuable for trade purposes. Both these metals are in various degrees of toughness and hardness. This is regulated by the proportions of the copper to the other metals, which is two-thirds, or more or less than that proportion, to the rest.

In iron we notice a pair of gates, by Porter (No. 2480). In brass (Nos. 2834 to 2838), church utensils by Messrs. Singer, a lectern by Skelley (No. 2841), a hanging candelabrum, in the Belgian Gallery, of fifteenth century style. A mixed work, a pulpit of wrought-iron with brass panels, is exhibited by Cox & Son.

Messrs. Wilkins, Betjemaun, and others exhibit specimens of gilt metal writing-table furniture, some of it ornamented with coloured enamel.

More important enamelling is shown by Mr. Willms, in the employ of Messrs. Elkington. This is "*champlevé*," the space of metal is dug out, and thick enamel let in, which passes the fire and becomes attached to the metal base.

The same firm and artist exhibit other good metal decoration in "*repoussé*," beaten up from the back, and then finished with the graver in front. In Nos. 2801 to 2809 specimens of such work will be seen, all conscientiously carried out.

The race-cups we omit, as they will be included in another report. Plate for church use is exhibited by Messrs. Cox, in the form of chalices, &c., taken from models of the fifteenth century, with certain modifications in some instances, *e.g.*, a square foot. The forms were originally governed by the particular convenience of handling during the office of the Mass. The square forms show that the reasons for the old arrangements are not observed.

The Belgian Court contains some fine specimens of goldsmiths' work of Mediæval design, chalices, &c., and one remarkable central piece in the case in which they are contained. These are by Bourdon de Bruyne, of Brussels. The fineness of the worked and twisted rims and edgings, and the general finish, should be carefully studied. Amongst the Belgian metal work we ought not to omit the trophy in bronze, supported by four military figures, presented by the Antwerp Civic Guards to the British Volunteer forces. Specimens of the finer French silver-smiths' work are expected, but at the date of this report they are not yet under exhibition. Table plate of modern design, by Dufour, is also exhibited in the Belgian Gallery. Notices of the engraved steel work belong to another report.

The most remarkable collections of the year in metal work are the various contributions from India. Here we find ourselves in contact with work precisely similar, in many forms, to the old Etruscan goldsmiths' work as it has been recovered for us from tombs in Italy and elsewhere. The methods of working gold now lost in Europe are still in full use in parts of India; particularly that of fretting gold by soldering fine spines or hairs of gold wire as delicate in effect as thistle down, yet done by unscientific workmen possessed of certain chemical secrets, which they put into practice by traditional usages. We touch only on this material, which is treated in the report on jewellery; but the serious attention of visitors cannot be too often directed to this interesting subject—*viz.*, the variety of artistic traditions in metal still in vigour in our Indian provinces.

The gold work which falls within our present inquiry is the Koofitari work. This is iron, chased with a tool into which soft gold, very pure, is afterwards hammered, the rough iron taking, by this means, permanent hold on the softer metal, which gets beaten into the fine scratches and hollows. The most imposing use of this material is in the decoration of arms and armour. It is also used to decorate buckles, clasps, workboxes or caskets, and various small objects for European use. The case of arms in the Indian Court contains specimens of this work on head-pieces, sword-blades from Gwalior, sword-hilts, &c.

We may also note the "translucent" enamels—that is, enamel colours painted on gold (generally), or gold leaf, which gives light and splendour to the colours. Jeypore is the finest school for producing this material; and several specimens of it are exhibited by the Governor-General of India in the Fine Art Galleries. A shield of transparent rhinoceros hide, from Kutch, is decorated with a border and bosses of this translucent enamel.

Excellent chain armour is contributed from Gwalior, the Maharajah of which State still keeps a body-guard of a hundred horsemen arrayed in this romantic panoply.

Armour is contributed from Lahore; a steel bow from Sealokote; other bows of wood, highly decorated, are exhibited. With these the native archer can knock down a sparrow, and has a knack of causing the arrow to strike prey so small with the shaft, and not the point.

An elephant goad, from Gwalior, is richly inlaid with gold. A Fakere, or devotee's crutch, plated with gold, and containing a formidable dagger, is contributed from the same State.

Stabbing daggers, that can be grasped by a transverse hilt, with which a man may strike an opponent above him while he is on the ground, are sent; the longest from Vizianagram.

A villainous weapon, known as a baghnak, a set of steel claws held by rings through which the fingers pass, is furnished from Gwalior. This has been before now the instrument of terrible deeds of treachery in Indian history, as the weapon is concealed by the closed hand.

We will bring our notice of these formidable treasures to a close by calling attention to a sword with gilt blade and enamel hilt, belt, &c., of Punjab work, exhibited by Lord Mayo.

Another curious use of gold is in the work exhibited by the Guickwar of Baroda. Iron vases and other vessels are ornamented with gold, hammered in, not in the branching, coral-like designs of the Koofit-work, but in discs or masses. The whole is afterwards polished in the lathe. Though less effective than the damascened Koofit-work, it is a method capable of varied and artistic application.

Before leaving the gold and enamel, we must call attention to a piece of Hyderabad manufacture, in silver, gold, and enamel. It takes, unfortunately, the unpoetic form of a spittoon.

From Madras we have silver plate after English designs. With these should be noted table plate of excellent form, decorated with repoussé work, from Kutch; and a dish of silver, pierced with borders, and circles intervening of hollow plates, like the bowls of teaspoons, gilt. Curious repoussé silver-smiths' work, bowls, &c., are contributed from Ahmedabad. It is beaten up first in small patterns, and holes are pierced to give effect to the pattern. At first sight it might be mistaken for coarse filigree.

The Beder work of black metal (an amalgam), inlaid with silver and gold, in bold flat patterns, is made by casting the vases. The core is first formed, then a vase of wax is formed round it, and a mould over that. The wax is melted out through holes made on purpose, and leaves a mould for the vase. When the metal is cold it is chased or roughed out in designs, and the soft silver or gold gently hammered into it. There is a case full of good examples.

Ostrich eggs mounted in silver, and fitted for European breakfast tables as egg-stands, are contributed from Kutch.

One of the most interesting cases in the Indian Court, and one of the most suggestive in the whole Exhibition, is that containing articles in the form of table-plate in brass and tin. It is contributed from Moradabad, Jeypore, and Nagpore. In this manufacture the body of the work is of brass, and pure tin is hammered over it, leaving spaces of the ground as ornament. So white and bright is the polished surface of the tin that the visitor will be inclined to take it for silver of plain manufacture.

Whether this surface and colour will stand—or, indeed, how they will behave under use for the table—remains to be proved. As a matter of decoration, we must try to direct the attention of artists and makers to a most suggestive method. These objects

are not made for the first time, but they come to us in a form (that of a substitute for silver plate) well worthy the study of the manufacturer.

Taken as a whole, the metal exhibition in the Indian Court forms a connected and most interesting collection. It contains work representing the earliest metallic traditions with which we are acquainted. It shows the continued manufacture of plate and chain armour, various highly-wrought forms of offensive weapons, and very interesting applications of brass and common metals and alloys. The modern workers in bronze are the Japanese and Chinese, and we do not see their metal work fairly represented. What we do see of Oriental produce, for splendour, simplicity of processes, cheapness, or suggestiveness, or more than one of these qualities combined in the same objects or classes of objects, forms a most instructive and delightful feature in the year's Exhibition.

THE BRITISH ARCHÆOLOGICAL ASSOCIATION AT WEYMOUTH.

THE Association visits Weymouth this year. The inaugural meeting took place on Monday afternoon at three o'clock, at the assembly-room of the Royal Hotel, where the President, Sir W. C. Medlicott, Bart, D.C.L., and the members of the Congress were welcomed by the Mayor and Corporation in the name of the town.

After the usual greetings had been exchanged, Mr. F. C. Steggall, the Town Clerk, delivered the following address:—"To the President and members of the British Archæological Association.—Mr. President and gentlemen—The mayor and corporation of the borough of Weymouth and Melcombe Regis beg, in the name of the inhabitants, to welcome you to their ancient and loyal town. They have not many objects of archæological interest in the borough, but its connection with the history of the past is very gratifying to themselves, and they have no doubt, from what you will learn during your sojourn amongst them, it will prove as interesting to you. It will be the pleasure of the mayor to afford you all the assistance and information in his power, and the inhabitants hope you will leave Weymouth with many pleasing recollections of your visit."

Mr. EDWARD ROBERTS, one of the hon. general secretaries, thanked the town for the reception and cordial welcome which the town had given the Association. This was the twenty-eighth occasion on which the Association had held meetings in various parts of the kingdom in order to bring forward materials for history, or to improve, if possible, those histories which had been written, and to increase the number of students in the historical and archæological relics of the kingdom. By means of a few gentlemen, who were members of the society, who had worked for many years amongst dust and rubbish, they had in their volumes produced materials which had added to the information of English people, and of all those who spoke the English language throughout the world. Dorset, it appeared to them, had never been fairly or properly treated. The one great history of the county was certainly not such an one as the county ought to possess. It was true that a reprint was now being made, containing many fallacies and errors which existed in the original edition, simply because it was desired that a reprint should be obtained, and not an improved edition. This was one of those things which could not be regretted but once, and that was a lifetime. He desired to see a history produced which should be worthy of the county, and hoped that during the forthcoming week many persons would be endowed with the spirit which would induce them to bring forward materials which would lead to a further increase of archæological knowledge.

The PRESIDENT thanked the meeting for the great honour which had been conferred on him in asking him to preside. At first he felt inclined to shrink from such a responsible duty, knowing how many more able men were qualified to fill the office; but at the same time he should ask the Association to give him their indulgence. He hoped that before the week was over he should go away far better instructed in archæology than he at present was. He then at some length read a paper on various objects of interest in the town and county, and concluded by hoping that the Association would have a pleasant meeting.

Mr. G. GODWIN, one of the vice-presidents, proposed a vote of thanks to the chairman, which was seconded by Mr. Black, and supported by Mr. John Floyer, M.P.

At the conclusion of the meeting the Association made a short excursion to the villages of Preston and Osmington, two pleasant places about three miles from Weymouth. The party was under the

direction of the Rev. Talbot H. Baker, vicar of Preston, who had caused the Roman tessellated pavement recently discovered to be uncovered for the inspection of the Congress. This relic of the past was found about eighteen inches below the soil. The pavement looks as fresh as if just laid down, although it is presumed that nearly 2,000 years have passed since the period of its accomplishment. That this had evidently been a Roman villa of no mean pretensions there is no doubt, for the bases of rows of columns are still there. Passages and rooms are also discernible, and there is every reason to believe that it is one of the finest specimens of Roman architecture that we have in the county. The Congress then proceeded to view Preston Bridge, and afterwards inspected the collection of antiquities at Captain Hall's residence.

After the return of the congress from their tour of inspection in the villages of Preston and Osmington, the inaugural dinner took place at the Royal Hotel, under the presidency of Sir William Medleycott, Bart. On Tuesday morning a party of the members and friends started at an early hour for their day's outing, Maiden Castle, an immense earthenwork fortification, being first visited. This is about three miles from Dorchester, and though from the discoveries which have been made it is a place of great antiquity, the term "castle" is quite superfluous, and calculated to convey an erroneous impression of the object to which it is applied. The term Maiden Castle should most probably be written Mew Dun, the Celtic for "great hill." The form of the elevated mass is an irregular oval, its greatest length being from east to west, and is about 160 acres in extent. The inner and upper portion of the area is nearly level, and its elevation from the adjoining plain from 60ft. to 80ft. This fortification consists of a series of very deep and steep trenches, on the top being a level plain covered over with turf. On the north there are three ridges, on the south five, and on the east and west six and eight; but those on the north are the most steep. The history and peculiarities of this early fortress were very clearly pointed out by the Rev. Mr. Barnes, better known as "the Dorset Poet," whose interesting description was eagerly listened to. The spot where the first halt was made, he said, was the place where once stood the western gate of the fortress, and before this was a great bank for the purpose of protection, but which had been cut through in later times. Near by some workmen, under the supervision of Mr. Cannington, who had kept his eye often on this spot, had made an excavation, from whence had been dug up four stones, the fragments of the pillars of the gate. From time to time there had also been found stone which showed that at one time there had been a stone breastwork on the bank, which, in all probability, had been brought from the neighbouring quarries of Upwey. Further on were traces of another bank, with a bend at the corner towards the east, which showed that the ground under the bank was the first camp of the troops, and when the Romans wanted more room for their cattle they fell back on the second or west camp: for in those times, when engaged in wars, the Romans not only brought in their women and children, but also large herds of cattle, which probably remained there for security for weeks and months together. Through the kindness of the Association he had been enabled to make some excavations on the ground, and the workmen had come to a spot which, in his opinion, had been a water-hole. During the various excavations which had been made of the barrows there had been found relics of the past which showed the place to have been inhabited long before the invasion of Britain by the Romans. Principal amongst these were two flattened sharp bones, resembling combs with teeth cut at the end of each, and which alone showed the spot to be one of very early date. Besides these there were flints, Roman pottery, bones of men and animals, and other objects, but most of them were of Roman date. By some Maiden Castle has been considered as of Roman origin, but a comparison between that and the camp at Dorchester would dispel that idea. The Roman castrum was nothing more than a mere inclosure of lines, marking the boundaries of the area required for the encampment, and capable of being guarded by sentries at their post, but without any of the ridges and labyrinthine entrances seen at this castle. The most probable theory is that the whole mass was originally a Mew Dun—a natural hill, and that its steepness first suggested to the ancient Briton the idea of converting it into a stronghold. Two or three vicinal roads may be traced branching from the eastern part of this remarkable fortress, and on the south side is a cavity which tradition asserts led originally to the centre of the town of Dorchester. That this stronghold of our forefathers is the work of art, and not of

nature is certain, but for what purpose—whether for defence or not—is altogether a matter of doubt. After nearly two hours had been spent in making a thorough examination of the remarkable trenches and other objects of interest on the castle, the Association proceeded to visit the Druidical circle at Winterbourne Abbas, a circle consisting of nine stones, each weighing about six tons. Three or four miles farther off was another object which could not fail to command the admiration of all who gazed on it. This was a most stupendous cromlech, which stands on the property of Mr. William Manfield, at Portisham, and which is said to be the only one in the kingdom. By some it is called the Druids' Altar. This cromlech consists of nine immense upright stones, varying in weight from six to nine tons, on the top of which is a large flat sloping horizontal stone measuring 10ft. 6in. by 6ft., and of the weight of 18 tons. All the stones are very rough, as if drawn from the quarry, except the under part of the horizontal one, which appears to have been roughly tooled. This cromlech stands on a very high and broad tumulus, and can be seen from some distance. By the people of the neighbourhood the cromlech is called "the Hellstones," and they have a tradition that the devil sent it from Portland, as he was playing at quoits. This relic of the past was an object of great interest, and the thanks of the Association, as well as of every archaeologist, are due to Mr. Manfield, who has, at his own expense, restored it. Luncheon was provided at the Ship Inn, Abbotsbury, in which village there is an abundance of material for the most devoted archaeologist to revel in. The party, placing themselves under the guidance of Gordon M. Hills, Esq., then proceeded to view the remains of the ancient Benedictine monastery not far off. The register of this monastery relates that "here was built, in the very infancy of Christianity among the Britons, a church to St. Peter, by Bertulfus, a priest to whom that saint had often appeared, and amongst other things had given him a charter, written by his own hand, wherein he professed to have concentrated the church himself, and to have given it the name of 'Abbotbury.'" Although opinions differ as to when this once splendid pile was erected, some writers ascribe it to Orcus and his wife Tola in 1026. This abbey, which was once so splendid and extensive, has long since paid the debt which the unerring finger of Time lays on everything, and is now so far decayed that it is well nigh impossible to trace what its former arrangements were. Mr. Hills gave a graphic and clear statement of the history of this once splendid abbey, and other objects of interest in the neighbourhood. After this had been done the party made preparations for returning to Weymouth, where they arrived between the hours of seven and eight.

Another party devoted the day to objects of interest in Weymouth and Portland. The members and friends of the Association assembled at the Council Chamber of the Guildhall, where, through the kindness of the Mayor and Corporation, the town regalia of Weymouth and Melcombe Regis, together with very antique seals and maces, were displayed, whilst there was a regular treasure chest of old documents for the perusal of Mr. Black relating to the borough.

Mr. BLACK said they had a rich collection of objects before them, and he was sorry to say, some he was incompetent to speak on. The first object was a very interesting collection of seals. It would be remembered that originally Weymouth and Melcombe Regis were two boroughs, but now they formed one, and amongst the seals were those belonging to the borough in its divided state, and others when it became united. Mr. Black then described the various seals, and afterwards directed attention to the old documents, some of which were in excellent preservation, whilst others would scarcely bear handling. These consisted of deeds and charters, principally of Edward I., Henry VII., and Elizabeth's times. One deed was a beautiful specimen of the handiwork of our forefathers, fully bearing out what Mr. Black afterwards remarked, that the farther back writing was traced the better the work appeared to be, whilst the more recent the worse it was. The deed in question was most beautifully illuminated and engrossed, and was from the King of the Herald's Office, dated 1592, saying what coat of arms the borough ought to have. Some of the ancient records were so effaced by time that Mr. Black could form no sentences out of them; but others were in excellent preservation, thanks to the care which Mr. F. C. Steggall, the Town Clerk, has taken of them. Mr. Black explained the reason, in answer to Mr. Hills, why the seals of Weymouth in Edward's time bore the arms of Castile and Leon, saying that it was because Edward married Eleanor of Spain, and as Weymouth always bore the royal arms of England, when he

married those of Spain were also added. Speaking of a seal representing a ship without a rudder, but with a steering oar, he said that Mr. Cruden, in his history of the port of Gravesend, sought to fix the exact time when the rudder was brought into use, but there had been great doubts upon that point. On the gold coins of Edward III. there was a ship with a steering oar, but the coins afterwards bore the impression of a ship with a rudder. From the documents in the Record Office, however, he found that the rudder was actually used at Bayonne in 1299, and there was a pen-and-ink sketch of it in one of the public records.

After about two hours and a half had been devoted to perusing the ancient documents and seals connected with Weymouth, the party, under the direction of Mr. F. C. Steggall, proceeded to the Guildhall, where they examined a splendid old piece of carving, representing the royal arms, both back and front being elaborately carved, and the arms bear the date of 1622. This piece of artistic work is carved from a solid piece of oak, and affixed over the mayor's chair in the Guildhall. It was presented to the town by Mr. Alderman Hancock, in 1842. Going a few steps further, the police-station was reached, where may be seen some relics of the former paraphernalia of municipal dignity, amongst them an antique chair, bearing date 1571, and by the inscription, "Remember T. Caillyng. Obeye thy Prynce." This was formerly the mayor's chair, though now reduced to its present ignominious position. There was also another object of interest at the station which excited much curiosity, being a large staff, curiously studded with brass nails, formerly wielded by the drum-major of the volunteers of 1803, when a visit from the First Napoleon was hourly expected. An adjournment was then made to the Custom House, where, under the direction of Mr. Steggall, a very ancient iron chest, a supposed relic of the Spanish Armada, was inspected.

As the weather was so wet, and the meeting had been detained beyond the time stated in the programme, the visit to Sandesfoot Castle was deferred, but after luncheon, the weather having by this time improved, the party proceeded to inspect the antiquities of Portland, of which there are many. They were here received by a deputation, who conducted them in carriages to view the ruins of Portland Castle, a venerable pile of former grandeur. Through the kindness of Colonel Belfield, R.E., the splendid collection of antiquities, chiefly Roman, was inspected in the Verne Museum. Other places of interest were also visited, the quarries and the wonderful Chesil Beach exciting the admiration of all.

In the evening the attention of the Congress was occupied by the reading of papers. The Rev. Mr. Barnes, B.D., read the first, this being "On the Origin and Tithing of English Law."

Mr. J. C. HALLIWELL, F.R.S., F.S.A., had promised to read a paper "On the Municipal Archives of Dorsetshire," but in his absence this was read by Mr. Gordon M. Hills, one of the hon. secretaries of the Congress. The papers were mostly of the fifteenth or sixteenth century, and contained some very curious entries of accounts. Amongst these were the following, relating to Bridport Church in the time of Queen Elizabeth:—"Imprimis, for whoyngne of the holy-water bokett with two newe hoopys, iijd. Item for mendynge the locke for the vestuare, viijd. Item for mendynge of the haspe of the Church yeare dore, ijd. Item, for ixli of wax for the Paskalle taper, the faute taper, the alter, xs. vjd. Item, for mendynge of the image of the best erosse with wyer, ijd. Item for iijli. of lead miltid in the best candestylkes, vjd. Item, to John Skynner for watchyng of af the Sepulchre, iijjd. Item, for mendynge of the key of the vestuare dore, ijd. Item, payd to the plummer when he came to see the Crosse upon the Tower, viijd. Item, payd to John Hudson, William Butcherell, John Downe, and Thomas Downe, for their paynes yn takynge down the erosse, xvjd. Item to Joen Howper, for a borde to mend the gutter upon the North fle, vjd. Item for nayles to nayle the same, jd. Item for a pounce and di. of wax for the tapers ayenst the dedycacion of the Church, xxjd."

Mr. HILLS then said that Mr. Black, F.S.A., would read some ancient papers which had once belonged to the town, but which he had never seen before.

Mr. BLACK then produced several old documents, all of which were of the black-letter period, but these he deciphered and expounded with as much ease as if he were simply reading English reprint. Most of the papers related to accounts at Weymouth, where, in one instance, "2s. was received for a Frenchman laden with salt."

Dr. J. W. WAKE SMART was announced to read a paper on "The Cerne Giant," but in his absence

this was read by the president, Sir William Medlicott. This remarkable ancient figure is cut on the hill side overlooking Cerne, where he stands with uplifted club, as though he were the tutelary divinity of the quaint old town.

THE TREASURES OF THE TIBER.

(From the Times.)

"O II! If the Tiber could speak!" is an exclamation which must have been wrung from the lips of many a stranger as he gazed down into that turbid stream from the parapet of the Sant' Angelo or of the Sisto Bridge. The Italians, it appears, are at last determined that the Tiber shall tell its own tale. They have made up their mind to search the river from end to end, from Ripetta to Ripa Grande, dredging it from the slimy surface of its present bed to the rocky bottom on which the river trickled before human history began. There is no doubt that in every branch of material activity the Italians have in these last few years developed a public and private spirit which will soon bring them to the level of the most stirring nations. The opening of the Mont Cenis Tunnel, by completing the new route to the East, will bestow on their country the main benefits of the land and water thoroughfares which other nations have traced across Egypt, and lay open to their maritime and commercial enterprise those remote regions with which the modern world was first made familiar by their forefathers, but from which they themselves have been estranged during many centuries of a decline which resembled lingering death.

This is prospective life in Italy; but in the instincts of the people of that country there must be always something retrospective. Whatever prosperity the present and future may have in store for them, the past will always cling to them. The new palace on the hill-side can never be so handsome or so commodious as to make them less proud of their grim ancestral castle, the battered towers of which still cumber the mountain-top. To console the Romans for the hard fate which doomed them to eternal servitude under Papal sway, the Emperor Napoleon endeavoured to persuade them that their true mission should be "*le culte des ruines*." The Italians, now masters of themselves and masters of Rome, have taken the Imperial hint. They have cast in their lot with their Roman brethren. A company has been formed at Rome for the excavation of the bed of the Tiber. There is nothing more catching than the enthusiasm of the Romans for their ancient river. They believe they have got a Pompeii—nay, ten times a Pompeii—under those waters, and they will set about fishing it up. Pompeii had a warning of its impending fate, and all the inhabitants could remove was withdrawn from the curiosity of after-generations. But the Tiber received all that Rome could not keep from it, and whatever went into it was never afterwards disturbed. The Romans look on their stream as the safe receptacle of all lost things. Search, they say, and you will find. Probe the shattered piers of the Sublician Bridge, they tell you, and you must reach the helmets and cuirasses of those Etruscan warriors whose bodies have been rotting there ever since the victorious townsmen of Horatius Cocles hurled them in, 2,367 years ago. Dig in front of Castle Sant' Angelo, and you may find some of the balls fired from the falconet of Benvenuto Cellini, with which he boasts of having killed the Constable of Bourbon and wounded the Prince of Orange during the famous siege and sack of the city in 1527. Sift the sands along the Lungara, and you may be rewarded with the signet ring, or some other personal ornament still clinging to the fleshless bones of the Duke of Candia, son of Pope Alexander VI., whom in 1497 his younger brother, Cesar Borgia, Duke of Valentinois, caused to be murdered and thrown into the river. Look, indeed, where you like, wherever the stream glides along the skirts of the Seven Hills, you have buried under its sands the evidence of the noble exploits and of the startling crimes of that people who filled the world with their name in a higher strain and for a longer period than any other human race. Where else than into its waters could be flung the crucifixes and the consecrated vessels which might compromise the secret convert to Christianity in the day of persecution; or where had the Christian himself in the hour of triumph a better Lethe at hand into which he might plunge the idols and all the relics of abhorred Heathenism, and doom them to perpetual oblivion? Where else, say the Romans, should we look for the cargoes of galleys and barges, so many of which have been swamped at Ripa Grande, in the turmoil of political strife or amid the havoc of natural convulsions; some of them, in olden times, laden with the spoils

of Tyre and Carthage, the marbles of Greece, the gems of India; some, in later epochs, with the trophies of Lepanto, the shrines and reliquaries of Palestine? Where else should the heads of Imperial statues, or those of warriors, statesmen, and Court minions, have rolled as they were knocked down one after another from the shoulders on which they were carved, and on which were to be grafted the features of the *Dii Minores* destined to have their own short spell of popular worship? Whatever had life in Rome would almost seem to have lost it in the Tiber. While everything around decayed and perished, and the world passed sway, leaving the site of Rome a dreary solitude, the ancient stream flowed on, sweeping away the *débris* of Rome's wreck, and awaiting the day in which it should be called upon to give up its memories.

We do not share all the expectations the Italians entertain as to the splendid results of their enterprise. Much more has probably gone down into the Tiber than may be hoped ever to turn up again. How those relics of so many generations may have fared during their long immersion will in itself constitute a most interesting scientific problem. The Tiber will tell us how metals, stones, gems, all organic and inorganic substances washed by the current, fretted by the gravel, or imbedded in the mud, may withstand decay, escape annihilation, or undergo transformation; what layers of rust may have accumulated on the sword of Brennus; what process of petrification the bones of the elephants of Pyrrhus may have gone through. No wonder the enterprise on which the Italians are said to be resolved has awakened the most lively interest, and called forth offers of encouragement, sympathy, and co-operation. The Italians will be working for the whole artistic and scientific world, and will thus repay the aid, both moral and material, by which most civilised nations contributed to bear them out victorious in that struggle for political emancipation in which, left to their own efforts, they must inevitably have succumbed. Having won Rome for themselves, the Italians will make its river the property of the world. The Tiber will become the common inheritance and the treasure-house of all mankind. The Italians could never have hit on a better scheme to give a fresh interest to the ancient metropolis in which they have established their seat of Government. They are sure to give the learned of all countries enough to think of, to discuss, and to write about for ages to come. To ingenious hypotheses the Tiber will oppose stubborn facts. No one can foresee what revolutions it will work in the whole realm of history and chronology, what fond systems and theories it will overthrow, what traditions it will confirm, what reputed myths it will explain and justify. The Tiber has held its peace for so many centuries; it ought at last to be fully heard.

BUILDING STONES OF DEVON AND CORNWALL.*

BY the term building stone we understand here, not merely stone used for building, but stone so specially adapted for the purpose as to have a more than local fame and utility—such stones, in fact, as those of Portland, Bath, Bosover, Hollington, and the Forest of Dean. A perfect building stone would be one easily raised from the quarry, obtainable in large blocks, of even and agreeable colour, fine grain, readily worked, and weathering well—that is, capable of withstanding the influences of the atmosphere. Very seldom are these qualities found united. Even with the best stone known great care requires to be exercised in selection and use. In the commercial sense of the term here used, with one exception Cornwall and Devon do not produce building stone; although large quantities of stone used for building are raised and valued in many localities.

Professor Ansted divides building materials into three classes—granites, sandstones, and limestones; and these again into stones which can only be worked by the pick or by wedges; and those which can be worked by the mallet or chisel. The latter are the freestones. The word freestone is of the most indefinite application, and in counties like Devon and Cornwall, where the varieties of stone are almost endless, can never be relied upon as meaning the same thing in two different localities. All the classes of stone named by Professor Ansted are found among the building stones of the West.

Granite is the one kind of stone in the two counties which is raised for commercial purposes outside their borders. Very large quantities are exported, chiefly from Cornwall. The main quarries, taking them from east to west, are at Gunnislake, the

Cheeswring, De Lank, Par, Penryn, and Lamorna; and many thousand tons which once were part of the Cornish hills, now form some of the proudest fabrics of the great metropolis. Granite has been worked on Dartmoor—most largely at Haytor, but the granite trade of Devon could never compare with that of the sister county, and is now at a very low ebb. For local purposes granite has been raised wherever it has been found, as the old churches of the granite districts throughout the West bear witness. The character of the material has had its influence upon the style of their architecture, which is generally plain and massive. The most notable exception is that of the church of S. Mary Magdalene at Launceston, almost every stone on the exterior of which has been elaborately carved. Locally granite was originally called Moorstone, and was chiefly procured from the large blocks where-with the moors are strewn. Carew says that in his time it carried the chiefest reckoning for "windowes dornes, and chimneys;" and Norden that it was "very profitable for manie purposes, in buylding most firm and lasting." Granite was chiefly raised from what may be called surface workings down to the time of Borlase, who notes five kinds—white, dove-colour, yellow, red, and black, and says that they were chiefly procured in Constantine, Tregonning, and Ludgvan. He gives the palm to Tregonning.

The elvans of Cornwall and the trap rocks of that and the sister county have been for time immemorial the prolific sources of building materials of great value. Elvans, indeed, are the chief source of Cornish building stone. The varieties of both elvan and trap are far too numerous to mention here. The most noted elvan is that at Pentewan, which Carew speaks of as somewhat resembling gray marble, and of which the present house at Anthony is erected. Other elvans at Illogan (used in Teldy House); at Creegbrawse (resembling Pentewan); and at S. Erme (of which S. Mary's, Truro, is built); have been mentioned with more or less commendation. In Devonshire the only elvan of note is that found near Plymouth, which once enjoyed a high reputation under the name of Roborough stone. Borlase describes the elvans as being hard to work, which would seem to indicate that he employed the term in a narrower sense than that in which it is at present used, as many of the elvans are of very loose texture. He notes also that elvan stone generally went into the wall in its natural shape. Fryce states the chief colours of elvan to be bluish-gray and yellow.

The trap rocks are almost more varied in their character and composition than the elvans. Thousands of little quarries have been opened upon either for immediate local wants.

The best known building trap in Cornwall is that which has been worked for centuries near Padstow, and called Catacleuse stone. Carew calls it black, but in reality it is dark gray. It is crystalline, chiefly composed of white felspar with specks of hornblende. Some of the best known building stones of Devonshire are trappean, especially in the Exeter district. The ancient castle of Exeter, and many of the old buildings there, are erected of a trap, slightly vesicular, from the hill on which the castle stood. A hundred years since a good deal of similar stone was raised at Thorverton, seven miles from the city; and quarries of felspathic trap at Pocombe, still nearer Exeter, are now much worked. The general colour is a dark ruddy brown. Some of the trap rocks are highly vesicular, and come within the category of what Sir H. de la Beche denominated trappean ash. In the neighbourhood of Tavistock an excellent stone of a greenish hue is used. It is raised at Hurdwick, about a mile from the town, in a quarry which, according to tradition, supplied the materials of the old abbey. The common form of trap is locally called dunstone, the blue being the most valued.

Slate is largely used for building throughout both counties; and in some cases answers well, although as a general rule its appearance is much against it. Under the head of killas, Borlase includes much that would hardly be so classed now; and it is not always easy to identify the stone of which he speaks. He divides killas into three varieties, yellow, bluish, and brown, and says that it presents a smooth face for building, but is feather-edged and apt to throw damp. Near Helston, in his time, a bluish and yellow killas was wrought in an ancient quarry, which was easy to square, but did not occur in large blocks. In many places the brown irony killas could be obtained in large masses, and was much used. The finest was found in the parsonage ground, Mawnan. One of the best, perhaps the best local building stone of this class, is that raised near Bodmin, and known as Margate stone. It is described by Dr. Boase as a kind of hornblende

* By R. N. WORTH, in the *Western Chronicle of Science*.

slate. The laminations are thick, the colour a drab, and the stone works easily and weathers well. Arcaceous slates are also worked for building near Liskeard, and in other localities.

A very considerable quota of the building stones of Devon is derived from the limestone beds. These are most extensively quarried for building purposes at Plymouth, Torquay, and Chudleigh, and are worked also in various parts of the North of Devon. They are mostly crystalline, and are not very easily wrought, but look and last well. The quantity at present raised for building, exclusive of burning, is enormous. There is very little limestone in Cornwall; but Dr. Borlase mentions a marble found near Padstow, used for chimney pieces and similar purposes; and another stone "of a marble texture," found on Goonhilly Downs, and at Kilkhampton, which cut into neat mouldings, and would bear carving.

The sandstones of the two counties are comparatively unimportant. The finest, and the only one which has ever enjoyed a reputation outside its immediate locality, is that found in the greensand at Beer, on the extreme north-eastern border of Devon. Of this stone the greater part of the fabric of Exeter Cathedral is built, and it was largely used in Devon throughout the middle ages, for window tracery and the like. It is of good colour—a gray—of even tint, and has been quarried at various points. The conglomerates of the new red sandstone have been extensively worked in Devonshire for centuries, and many old churches exhibit the fairly enduring qualities of this unpromising material. It was and is largely raised at Heavitree (formerly under the name of Wreford); and is quarried also at Exminster, Kenn, Pakeham, Torquay, and other localities. A sandstone of recent date, arising from the partial consolidation of the deposits of sand on the north-west coast of Cornwall, occurs in the neighbourhood of Newquay. It was used in the erection of Crautock church, and is described by Borlase as the only perfect freestone he had seen in Cornwall, although in other parts of the county a freestone of sand and quartz was to be found. Carew speaks of a stone not much differing from the eastern freestone taken out of inland quarries; but it does not appear what he meant.

A stone which once enjoyed a very high reputation, and is once more springing into repute, is the polypbant, raised near Launceston, of which the ancient doorway of the "White Hart" in that town (a relic of the old priory there) is formed. The colour is between greenish and iron gray; it is easily worked, takes a fine polish, and is very lasting. Dr. Boase classes it as a kind of serpentine.

Though not in the strictest sense of the term a building stone, reference should be made to the roofing slate produced at Delabole and other localities in the North of Cornwall, and (not much inferior in quality though not less extensively) in various parts of South Devon. The Delabole slate has enjoyed the highest reputation for centuries, and in Carew's time was largely shipped to Brittany and the Netherlands.

THE NEW COURTS OF JUSTICE.

THE *Times*, in noticing the photographs of Mr. Street's amended design for the new Courts of Justice, seems disposed to wish the whole question reopened. We should be glad to know to whose inspiration the leading journal is indebted for its evident leaning towards a new competition. "The best," the *Times* thinks, "that can be said of Mr. Street's design as a whole is that it has a certain picturesqueness. Picturesqueness is very well in its way; Gothic architecture lends itself to the picturesque, and in Beckford's house or Walpole's villa we can be content with the picturesque and no more. But we want much more than this in a great building devoted to a great purpose—a building which is intended to stand for ever, in the centre of a metropolitan city, as a chief credential of its empire and pre-eminence. We require pure and noble form, exalted dignity, entire unity. That these are not incompatible with Gothic architecture and with wealth of detail no one knows better than Mr. Street; but he has given us instead of these a chaos of ill-distributed masses of weak and confused outline, without form, and void of everything but freaks of detail with which they are stuffed full from basement to pinnacle. Looking at the photograph of the Strand front, no one who did not know it would say it was a design for the Courts of Justice of an Imperial city. It looks rather like the photograph of some street in a collegiate town. The row of buildings seem to consist of some goodly houses, a church, a town-hall, handsome enough if we suppose them such,

but very mean indeed when we know them for what they are. The town-hall portion, which is to the right looking at the picture, is decidedly the best, and if it be cut off from the rest by a blank sheet of paper placed over the squeezed-up gables next to it we get a building of some comparative dignity, and a faint idea of what the whole might be and ought to be. The general effect of the front is far too ecclesiastical, and this 'effect defective' comes by a cause which is in the hand of the architect and not in the nature of the architecture. A Gothic building may be, and this should be, Gothic to the foundation-stone without looking in the least like a church, or like a huge monastery, which this resembles. But it is hard to say what it resembles, for it is a hotch-potch of everything. By placing sheets of paper over the design, so as to leave a part exposed at a time, a good church, school, or private house may be got out of it, but neither by looking at it in the part or the whole can a good Law Court, or what is the least like a good Law Court, be got out of it. We are not now judging the interior, but Mr. Street is ecclesiastical indoors as well as out of doors, for he has vaulted his great hall. This great hall is meant for the strongpoint of the design, but what strength lies in its false roof and window sunk between heavy and unmeaning towers we cannot discover.

"In what should be the cardinal virtues of a design for such a building as the new Law Courts, in dignity of form and unity of conception, Mr. Street's drawings are altogether wanting. A good test of this is that in his Strand front a piece of blank wall could not anywhere be endured. The whole is crammed with detail, the variety and multiplicity of which are relied upon with a confidence which is entirely misplaced, for, though good form may carry off bad detail, good detail will never carry off bad form. The towers on either side of the great hall (we do not mean those on the great hall itself, though they are ugly, too) are exceedingly ugly, and the half-hidden gables at the same places produce an effect which is most pitiful and poor. The whole front is without balance; there is no compensation of parts, there is no centre, there are not even two ends. We are not silly enough to suppose that a great and able architect such as Mr. Street is has left all this out of his design because he forgot, or did not know how, to put it in. What we do suppose—nay, what we feel sure of—is that he has of malice aforethought avoided it, conceiving that an irregular and fanciful pile of building would give him better opportunity for a display of that mastery over detail in which he excels, and which, doubtless, gave him the premium. But we require something more for our Palace of Justice than a crowd of towers, and gables, and chimneys, and pinnacles, scarcely any two of which are alike. We require a grandeur of elevation, a majesty but not monotonous unity; we require lines which prolong and repeat themselves in beauty, lines which the eye may rest upon and follow, instead of the twists and the turns, the nooks and the corners, the queer recesses, and the queerer protuberances which will make up the Strand front of the new courts if these drawings be adopted.

"Much as we admire Mr. Street's fertility in detail, it seems to us that in a regular and noble building much of the detail he has employed would be altogether out of place. He has gone far beyond what is necessary for the brilliancy and individuality which should be stamped upon the work of a master hand, and has deviated into a pretty pettiness altogether unworthy of a great design. The studied care with which almost every window is made to differ from its neighbour, the formal indication by slanting courses of stone of the staircases in the towers, the manifold patterns of ornament, the minute and particular differences of gable and pinnacle—all this and more may be in its place and of value in small and private work, but it is out of place and positively pernicious in great and public work. There is, for example, a window in the extreme left facing the drawing. It consists of three lights, one of which is separated from the other two, and thrust from the middle of the gable by a pier some feet in width. Such an uncomfortable and ill-balanced combination may be quaint enough to be worth its ugliness in an ordinary house or church, but it should have no part in a great and serious architectural effort. The old masters in Gothic architecture excluded such frivolities from their more majestic work. They had a sense of times and places; they loved to indulge in frivolous whims, but they knew where to indulge in them, they knew that order was not incompatible with their art, and they could have built a Palace of Justice

which would have been the perfection of Gothic architecture, and yet would have been as orderly as the Parthenon. The town-halls of Louvain and Brussels, and especially the town-hall of Piacenza, are instances of this. They show us that the Medieval architects did not fear uniformity, knowing that where there was no regularity there could be no sublimity. The Piacenza town-hall has a row of seven or eight windows of the same measurement. It is scarcely too much to say that in Mr. Street's design, except in one place, no two windows match. The exception is, significantly, in the finest part of the building, and there three of a size are boldly set in a row. We should be very sorry indeed to see these drawings carried into execution. The Law Courts are to stand for ever as a witness for good or ill of the art of this age, and should surely have about them something better than a pseudo-ecclesiasticism, a picturesque irregularity, a profusion of petty and fanciful detail. They should have some horizontal lines to charm the eye with a beautiful continuity, some vertical lines whose chaste ascent would draw it upwards. As it is, the eye is checked and perplexed at every stone, it has nowhere to rest, it seeks form and dignity and finds only a labyrinth of detail. The present design is radically mistaken, and cannot be mended; there is no reason we can see why there should not be a new competition, and there is every reason why expenditure should not be allowed to go a pound further before the fault or merit of these drawings has been fully debated and fairly decided. Mr. Street need not be the loser, but the nation must not be the loser—must not give its good money for what appears to us to be bad art."

NEW CHURCH AT COTHAM.

THE *Bristol Times* and *Mirror* states that the designs of Mr. John Bevan, of St. Leonard's-chambers, Nicholas-street, have been accepted in limited competition for the new church which is to be erected at Cotham in connection with the district of S. Matthew's. The edifice is to accommodate about 700 persons. It is to be built in the Early Gothic style, of Pennant stone, with free-stone dressings, and it will consist of a nave, north and south aisles, apse, chancel, organ chamber, and vestries for the clergy and choir, and there is also to be a south porch, and a tower and spire 140ft. in height at the eastern corner of the south aisle adjoining the chancel; the tower and chancel forming one end of the building as seen immediately upon approaching the church from the Redland-road. The roof is to be open-timbered, stained and varnished, and the seats are to be of the same material. The covering of the roof is to be slate. Provision is made for the heating of the church, and also the lighting, which latter will be by means of numerous windows in the clerestory as well as the outer walls. The cost of the church will be about £5,000, and though this is by no means a large sum, the building will, apparently, when finished, be a very elegant structure, and quite an ornament to the neighbourhood. Building operations will be commenced without delay.

INCONVENIENT SIEGE OPERATIONS.—The recent siege operations carried on by the Royal Engineer authorities at Brompton, between Old Brompton and New Brompton, have caused some dissatisfaction at the Highway Board for Gillingham, whose jurisdiction extends over Old and New Brompton. At the last meeting of the board complaint was made that public footpaths across the lines had been stopped or diverted by the military authorities in order that the mining operations might be carried on, while no communication on the subject had been made to the board.

THE AMALGAMATED SOCIETY OF CARPENTERS AND JOINERS.—From a manifesto issued by the executive council of this society sitting in London last Saturday, it appears that a definite split has taken place in the whole body—numbering over 10,000 members—the rival executives, acting respectively in London and Manchester, each claiming obedience from the members. The London council in their manifesto say that "between the branches now there is not the slightest cohesion," and add that the result of the plea set up by the Manchester council before the magistrate at Marlborough-street lately, to the effect that the society was not entitled to the protection of the Friendly Societies Act, has been "to rend our institution asunder." They conclude by saying, "whether the number of branches who agree to be governed by the rules increase or diminish, we shall still do our duty, and continue the Amalgamated Society of Carpenters and Joiners."

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

YORKSHIRE ARCHÆOLOGICAL AND TOPOGRAPHICAL ASSOCIATION.—The arrangements for the visit of this Association to Leeds, on the 30th inst., have been issued. After the members of the Association have been officially received and welcomed by the Mayor (Mr. Alderman Barran), they will start in saloon omnibuses for Adel Church, where they will be met by the Rev. George Lewthwaite, who will give a short address respecting this interesting Norman work. The large collection of Roman and other objects found in the parish will, through the kindness of the rector, the Rev. E. T. Simpson, be exhibited. After an inspection of the church, the party will proceed to Kirkstall Abbey. Luncheon will be served in the Abbey grounds, after which a lecture on the Abbey will be delivered by Mr. Sharpe. The Norman work recently disclosed during the alterations in the building formerly used as the gatehouse, will, by the permission of Major Bntler, also be open to inspection. Later in the day the party will pay a visit to S. John's Church, Leeds, which is almost unique as a seventeenth century church, and contains a magnificent screen, dividing a two-aisled nave from the chancel and gothotha. The special features of the church will be pointed out by Mr. J. T. Micklethwaite. It will thus be seen that this visit to the ecclesiastical antiquities of Leeds promises to be of a very interesting character.

NORTHERN ARCHITECTURAL STUDENTS' SOCIETY.—By permission of the Earl of Durham, an outdoor meeting was held on Saturday, the 19th inst., at Lambton Castle. The members composing the party travelled from Newcastle to Chester-le-street, by rail; and after inspecting the ancient church there, walked to the Castle; over which they were conducted by the resident architect. The stabling and gardens were also visited. After leaving the Castle, the members walked to the modern church of Burnmoor, and ultimately returned home by rail from Fence Houses.

PARLIAMENTARY NOTES.

THE WATER SUPPLY IN LONDON.—The Earl of Shaftesbury, on Thursday week, in asking her Majesty's Government whether it was their intention next session to bring in any measures in reference to the water supply and for the regulation or abolition of the truck system, expressed a hope that his noble friend opposite (Lord Granville) would be able to give a satisfactory answer to both points of the question. With respect to the water supply, the reasons were very urgent why Government should come forward to devise some means of rescue from the irresponsible power under which the country was supplied at present. It would be remembered that eleven years ago, when the late Lord Derby's administration was in power, a commission was appointed to inquire into the sources of supply. The commission made a most admirable and exhaustive report, but as yet nothing had been done upon it. And it was the more necessary that something should be done because there was not only a greater need for an increased supply of water, but there were sources of corruption and mischief in the supply we had. He believed there was scarcely a pint of water in London which was strictly wholesome, and a great deal of the water was positively unsafe. As to the water given by the water companies, it was by no means what it ought to be. Regarding the wells in the metropolis, he believed there was scarcely one well from which one might be assured of drawing water which was safe. Some of the most favoured pumps, such as the one in Old Broad-street, and the one in Temple-gardens, which were formerly much resorted to on account of the beauty and coolness of the water, had been positively shut up because they contained deleterious matter. It was perfectly well known that more mischief arose from bad water to the human constitution than from bad clothing or bad housing. There was scarcely a great town in the whole kingdom which was not better supplied than London. Glasgow, Greenock, Manchester, and Sheffield were all provided with ample reservoirs from which there was an abundance of water of the best quality. There was no stint in the use of water to the inhabitants of those towns, and there was no possibility of any deleterious particles getting into the supply. He trusted to hear from his noble friend that it was the intention of Government to take this question of the water supply into consideration, and to bring in a measure next year. Cholera was again approaching this country, and the importance of a pure supply of water could not be over estimated, especially in a city containing four millions of people.—Earl Granville entirely agreed with his noble friend that there was nothing more important than providing a supply of pure water to the city. A bill had been introduced into the other house of parliament on that subject, and had been referred to a select committee. That committee sat, and the bill was now before their lordships. He hoped a select committee would be appointed to-morrow, and that the bill would become law before the end of the session. He also trusted

it would be a satisfactory measure, and that it would effect the objects of the commission. He also hoped that in the course of the next session a bill would be introduced which would give far greater powers for providing a constant supply of pure water to the metropolis.—The Earl of Shaftesbury said that the Water Bill before the House was better than nothing; that was all that could be said for it.—Lord Truro said that the increase of the water supply was of less importance than the improvement of its character, and he hoped that a bill would be introduced next session.—Earl Granville said the Metropolitan Water Bill was not a perfect bill, but it did refer to the constancy of the supply and the quality of the water.

THE REGENT'S CANAL.—Mr. Eastwick, on Thursday, asked the President of the Board of Works whether he would cause inquiries to be made into the alleged insalubrious state of the Regent's Canal, which at North-gate is covered with green slime, and is even yet worse at Maida-hill, and causes alarm to persons in the neighbourhood in view of the approach of cholera.—Mr. Ayrton replied that he had reason to believe, so far as he could ascertain, that the Regent's Canal was not in as bad a condition as it had been in previous years. It certainly was not agreeable to look at, inasmuch as it was used for the purposes of trade, and not for ornament. A person who had resided with his family on the banks of the canal for eighteen years had written to him to say that a green weed floated on the surface at this season of the year, but that he could not detect any unpleasant effluvia arising from it; and in his experience the canal was never so free from offensive smells as it was at that moment. If there were anything injurious or offensive in the condition of the canal, he (Mr. Ayrton) believed that the local officer of health was the proper person to take notice of the fact, and if that officer failed in the discharge of his duty the Home Secretary would be bound to interfere when applied to.

THE FRESCOES IN THE HOUSES OF PARLIAMENT.—On the motion of Mr. Locke, on Friday, a return was ordered of reports to the First Commissioner of Her Majesty's Works and Public Buildings respecting Fresco Painting in the Houses of Parliament.

Building Intelligence.

CHURCHES AND CHAPELS.

ALDBOROUGH.—The parish church of Aldborough, Holderness, was reopened on the 9th inst. by the Archbishop of York. The church has been restored under the direction of Mr. Perkin, architect, at a cost of £1,800. Among the relics was found a stone, now rebuilt into a wall, stating that, in the reign of Canute, Ulf, the Dane, built the church "for the souls of Hanun and Gundart."

BURY.—On the 23rd inst. the Bishop of Manchester laid the foundation-stone of the new church of S. Peter, near Bury. The edifice, which will be in a style of architecture representing the transition from the Early English, or Pointed, into the Geometrical, will consist of nave, aisles, and chancel. The nave will be 75ft. by 48ft. (including aisles), and the chancel 36ft. by 24ft., the height to ridge in both cases being 52ft. The church will accommodate 500 persons, and its cost will be £4,500, exclusive of tower, spire, and eaving. The architects are Messrs. Maycock & Bell, of Manchester.

CHILDSWICKHAM.—The parish church of Childswickham has been restored, under the superintendence of Mr. G. Hunt, of Evesham. The nave walls have been rebuilt in the style of the fifteenth century like the tower of the church, as none of the original work in the nave was thought worth preserving. The walls are of Broadway Hill stone, with Bath stone dressings. There is a new roof and new seats. The old Norman doorway at the west end of the nave has been restored. Some extra work was done in the north transept, but not under the architect's superintendence. The upper part of the spire has been rebuilt, and the other part restored by Mr. Frith, of Coventry. Mr. Gill, of Bourton-on-the-Water, was the builder.

DUMFRIES.—S. Andrew's (Roman) Catholic Church is to be enlarged. The nave is to be lengthened fifty feet, with transepts on each side of the new portion, so as to give the church a cruciform appearance. The east end of the nave will form an apse, with a dome. In each transept there will be a chapel. The arches of the transepts will rest on pillars of Dalbeattie granite polished, and on each side of the apse will be square columns of red freestone, with panels of polished granite. These columns will be ornamented with carving of scroll work. The cost of ground—which will afford additional playground to the school in connection with the church—was £1,000, and the expense of the building will be about £3,000.

HENLLYS CHURCH (MONMOUTHSHIRE).—This picturesquely-situated and fine specimen of fourteenth century work is about to undergo considerable alterations and additions. The present floor, which is much below the outside level of ground, and in winter times often inundated with water, will be raised to 6in. above the outside level. A fine moulded panelled oak ceiling, with carved bosses, but now covered with plaster and yellow wash, will be made good, and exposed to view. Three fine toned bells, which are in a most dangerous and useless state, will have new carriages, &c., and be put in proper working order. The whole of the present high-backed pews will be removed, and replaced by open ones with sloping backs, book boards, &c. The ceilings to nave and porch roofs will be covered with circular boarding. The communion, altar table, pulpit, and desk will be new, and the whole of the present yellow wash removed from the walls. Liberal grants have been made by the various church building societies who have approved of plans. The contract is taken by Mr. W. Jones, builder, Newport, and will be carried out from plans and under the supervision of Mr. E. A. Lansdowne, architect, Newport.

HOOK.—The new church of S. Mary, Hook, near Southampton, has been consecrated. It is built in the First Pointed or Early English style, and the external walls are of Swanage stone, with Bath stone dressings. Internally the church consists of an apsidal chancel, nave, north and south aisles, vestry, and organ chamber. The seats will accommodate over 300 persons. The cost was £4,000. The architect was Mr. Raphael Brandon, of Clement's Inn, London, and the contractors Messrs. Dove, Brothers, of Islington, with Mr. J. Osborne as clerk of works.

LITTLETON.—Four years ago the church of North and Middle Littleton was nearly rebuilt, and during the present year not only has a school been built at a cost of £700, but the church of Middle Littleton has been restored by Mr. Preedy, architect, at a further cost of £1,800.

LOWESTOFT.—The restoration of the old parish church of S. Margaret, Lowestoft, has been completed under the superintendence of Mr. J. L. Clemence. The first part of the work—taking down and rebuilding the south aisle and south arcade—was executed by Mr. C. Godbolt, of Harleston, builder. The church has been re-seated, and there is a pulpit of oak and stone; the upper part composed of tracery panels, buttresses, and pinnacles, and the base carved and moulded stonework. The chancel, and also the risers to the steps, are laid with various coloured encaustic tiles in patterns. The crypt now forms the vestry, having been restored. The porch has also been restored, and there are new windows, paving, doors, &c. The cost was about £4,000. The contractors were Messrs. Lucas, Bros.

SELLY HILL.—The new church of S. Stephen, Selly Hill, near Birmingham, has been consecrated. The building seats 300 persons; it is nearly 112ft. in length on the outside, and 30ft. wide, and the roof, open to the ridge, rises to the height of nearly 45ft. The edifice consists of nave, chancel, vestry, organ, and tower and spire; there are no aisles. The roof is an open-timbered one, carried on trusses, without intermediate supports. A lofty arch, supported by two carved and ornamental pillars, separates the nave from the chancel, the east end of which will be polygonal. The edifice is built of stone, and is in the English Gothic style of architecture; the dressings are of Bath stone, lined internally with the best pressed bricks. The altar cover, lectern, &c., were supplied by Messrs. Jones & Willis, of Birmingham and London. The architects are Messrs. Martin & Chamberlain, and the builder Mr. Charles Jones.

SOUTH BRENT.—The work of restoring the parish church of South Brent, Devon, commenced about twelve months since, has been brought to a complete termination. The original church, of the Norman period, was built in the eleventh century, cruciform in shape, the present tower being the centre, and a curious old building on the south side, now used as a vestry, the transept. The other portion of the church is of more recent date, built in the fifteenth century. A curious fact in connection with the church is, that originally stone benches around the pillars, portions of which still remain, and stone seats in the windows, afforded all the sitting accommodation deemed necessary. The present church is dedicated to S. Patrick, and consists of a nave, side aisles, north and south transepts, and chancel, with tower at the west end, and adjoining it a vestry. The building is chiefly Late Decorated and Perpendicular, with, however, Early English remains at the west end. The roofs have been replaced by new ones of Memel. The whole of the internal

plastering has been removed, and the masonry throughout has been scraped, repaired, and pointed, plastering being nowhere used as a covering inside or out, except over a small portion of the plain masonry at the west end, where the stones were extremely small and rough. The sedilia and piscina in the chancel, which had been partially destroyed and blocked up, have been opened and restored. The piscina also in the north chancel aisle (where was an altar to Our Lady) and the stoup within the south porch, have been opened. The whole of the restoration has been carried out from the drawings and under the direction of Mr. Hine, F.R.I.B.A., by Mr. Pethick, contractor, of Plymouth.

STAMFORD.—The work of strengthening the foundations of All Saints' Church, Stamford, is progressing satisfactorily. The massive pier which carries one end of the lofty Perpendicular chancel arch, and receives three responds of the Early English south aisle and chapel, is being put on a very substantial basis; while it was kept in position by beams and by bars of iron the spot beneath was excavated, and a solid block of masonry will soon fill up the opening. It would seem that the Early English church (the remaining parts of which are very fine) was erected on the site of an earlier and inferior structure, for the pier above mentioned is found to have been built on mere rubbish that had been thrown together without mortar, and from this debris fragments of human bones and of a stone Norman coffin have been picked out, which have evidently been disintegrated before the present church was erected.

BUILDINGS.

ACCRINGTON.—New schools are being built at Accrington for St. John's parish by local contractors. Mr. William S. Varley, of Blackburn, is the architect. They consist of a girls' and boys' school and class-rooms, with entrance porch, &c. The external walls are being built pier point and brick lining, having a cavity between. The roofs are open-timbered, stained and varnished. The cost is estimated at about £1,430.

BELFAST.—The new theatre in Belfast is now almost completed. Scenes from Shakespeare's plays will be found in every available situation—the night-scene from "Macbeth," the Battle of Bosworth Field from "Richard III.," the balcony-scene from "Romeo and Juliet," the storm from "King Lear," the church-yard in "Hamlet," and others. On one side of the building five heads will be placed in niches—Pistol, Puck, Lord Dunsenry, Touchstone, and the Nurse ("Romeo and Juliet"). Heads in *bas-relief* of the following persons will be placed along the great hall: Barry Sullivan, Charles Kean, Mrs. Kean, Mrs. Warden, Kemble, Garrick, Titiens, Macready, Helen Faucit, Brooke, Miss Bateman, Mr. Warden, Toole, Sothorn, Buckstone, and Charles Mathews. On top story are Shakespeare, Schiller, Lytton, Meyerbeer, Sheridan, and Goldsmith.

GRAVESEND.—S. Mark's new schools, in connection with S. Mark's Church, Rosherville, were opened on Tuesday week. Messrs. Wadmore & Baker were the architects, and Mr. J. Gould the builder. The dimensions of the chief room are 50ft. by 20ft., infant room 30ft. by 18ft., and classroom 14ft. by 18ft., and will accommodate about 100 scholars.

LINCOLN.—The provincial grand lodge of Freemasons for the county of Lincoln was held on Friday week, when the foundation-stone of a new Masonic hall in Newland was laid. The hall, which is 78ft. long, 32ft. wide, and 25ft. high, has an orchestra at the extreme end, 16ft. wide, and 13ft. deep. Exclusive of the orchestra, the hall will seat 700 persons. The building is designed in the Geometric style. The front will be 45ft. wide and 50ft. high from the pavement to the apex of the centre gable, which in itself forms an equilateral triangle, in the upper part of which will be carved the circle containing the square and compasses, with the eye in the centre. The gable will be surmounted by the life-size figure of S. John.

PRIOR'S LEE.—On the 9th inst. the foundation-stone of a new infant school was laid at Prior's Lee. The style of the building is Gothic. Internally, the roof is of pitch pine, moulded and varnished. The school will accommodate about 200 scholars. The contractor is Mr. J. F. Cobb, of Chetwynd End, Newport, and the architect Mr. Fogerty, of Victoria-street, London. The building will cost about £1,400.

A statue of Brunel, the engineer, has been temporarily erected on the unoccupied space on the Thames Embankment which has excited much angry controversy. Stuck in the middle of a desolate waste, the figure presents a very forlorn aspect.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

F. S. SMITH.—Thanks for several items of information.

MELLOR & SUTTON.—We make no charge for inserting illustrations and description of works.

CHARLES TURNER.—Manuscript to hand.

RECEIVED.—J. W. Palliser, E. H. L. Barker, H. V. Tippet, R. & S., E. T. J. P., J. B., J. F., Doulton & Co., J. H. W., J. C., S. S., Bialko, T. T. J. P. S., W. R., T. R. S., C. L. E., [E. & D., T. G., J. H.]

Correspondence.

SOMERSET HOUSE AND THE THAMES EMBANKMENT.

To the Editor of the BUILDING NEWS.

SIR,—Referring to "W. W.'s" impartial and, what appears more now-a-days, truthful letter in your last week's issue, there appears to me to be one very important item that he has omitted; for, although I agree with him as to the culpable ignorance displayed in the treatment of the balustrade, I think he will be willing to acknowledge, upon a second consideration of the subject, that if the balustrade, instead of being carried right across, had been returned on either side of the large central-keyed arch, which was formerly used as a water-gate to Somerset House, and the arch itself filled in with bold and elaborate wrought-iron work, there would not only have been a pleasing addition formed thereby, but it would have, at the same time, greatly enhanced the fine architectural effect which the arch, until the erection of the balustrade, has formed to the terrace front of this building.—I am, &c.,

G. A.

SELENITIC MORTAR.

SIR,—It is not my intention to enter into the patent controversy on this subject now being carried on in your columns, or into the comparative merits of carbonates or sulphates, but to point out a few facts that have come under my notice at various times.

In the south of Europe, and generally in the Levant, the interiors of all handsome chambers and saloons are, and have been for centuries past, finished with fine white or tinted stucco, impervious to smoke or other exhalations, which being nearly as hard and beautiful as marble itself, can be washed and cleaned with equal ease. This stucco is, however, no substitute for ordinary mortar, and its present title of "Selenitic" is rather a misnomer. This stucco is simply composed of white well-slacked lime and fine marble dust, to be obtained wholesale from quarries or workings, and is well-described by Vitruvius, considering that in his time the science of chemistry had then no existence.

It should be observed, however, that in those countries where such stucco is used the walls are invariably composed of hard materials, and that it is vain to attempt to make this, or any other, cement adhere to soft walls, such as are found in the general run of buildings in this country. This fact is rendered obvious by the examination of demolitions. Indeed, in such case, even the New Palace of Westminster would produce a mountain of dust, mingled with larger rubbish, and the adherence of any stucco to such walls is hopeless.

In this town a handsome church is now being pulled down and rebuilt, because for years it has been found that no stucco or costly cement will adhere to such soft walls for many months. In this country interior plastering is done with slaked lime alone, called putty, by builders, which has no set whatever, and ultimately cracks and falls to powder; good clay would be preferable. Ceilings are done with plaster of Paris, lowered down with whitening, a most rubbishy material, of no strength, and extremely absorbent.

In regard to mortar, I may remark that there are two kinds in the south, as elsewhere, one made of white lime for dry works, the other of buff-coloured lime for foundations and waterworks, which sets hardest when covered with water as soon as left by the trowel. Pozzolana, which is a volcanic clay iron ore, found in any quantity about Rome, is sometimes used, instead of the usual sharp cleau grit, for very important works. It takes its name from being dug out of wells: "Pozzo," Italian for well.

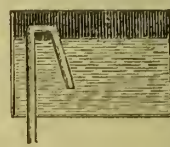
Some years since it was deemed advisable to open a new gate in the walls of Leghorn, when gunpowder was required, as the mallet and chisel which would cut the brick made no impression on the mortar. Owing to the possession of such excellent lime mortar, it has become the fashion of late in the wine countries to build the large circular wine vats of bricks and mortar, the smaller of 4in., and the larger of 9in. work, plastered inside and out two coats of the same mortar with which they are built, and made use of as soon as finished. Of course they were hooped for safety, and can be built of any dimensions. Besides the white and buff lime, the Italians possess two sorts of plaster-stone, one similar to that in common use with us, that sets immediately; the other very similar to the first, but takes from twenty minutes to half an hour to set, giving time to run the work, and that without any adulteration, so that it possesses great hardness when dry. Neither of these will stand for outside works like the ordinary mortar, especially that made with buff lime, which requires no coat of oil paint to keep out moisture.—I am, &c.,

C. E.

Reading.

HOUSE CISTERNS.

SIR,—At page 129, "M." observes that I blindly abuse his suggestion of the siphon, and that my objections are untenable. Now, I object against his siphon with my eyes open, and my objections are perfectly tenable, as the following sketch will show. In the



first place, I object to it because it is a siphon; for, being such, if once started to run, it would never stop so long as water remained in the cistern; but, by the time the cistern was half empty the ball-crane which fills it would be running full bore. We should thus have a continual overflow and supply going on at the same time, the result of which might be the waste of many thousand gallons of water before the waste was discovered. Consequently, were the water company which supplied the water aware of the circumstances, they would be quite right to charge for the water wasted, and the plumber who fitted in a siphon for a cistern overflow ought also to be made "pay the piper" for his untradesmanlike work. There is another point, also, in the matter. Supposing the cistern to get empty, and to remain so for several days, what was to keep the smell back then? I think I have said sufficient to prove that using a siphon for a cistern overflow is neither right theoretically nor safe practically. Where a bell-trap is required in a cistern, something such as I recommended is nearer the mark, while the persistency with which "M." supports his mistake shows the necessity for members of sanitary staffs being men who thoroughly understand their work.—I am, &c.,

PLUMBER.

Intercommunication.

QUESTIONS.

[2288].—**Water Impregnated with Lead.**—I have a case in which the water of a well is found to become extensively impregnated with lead during its passage through the pump-pipe and the pump. It is very strange that this should be with clean, newly-laid pipe, while nothing of the kind was ever perceived during the many years that the old pipe (which has been lately superseded by the new) was in use. Is it probable that there might exist on the interior of the new pipe lead in such a chemical condition as to be readily soluble in spring water, and that what we now perceive may last only while such is being washed from the interior surface? I have (rather lately, I think) seen recommended for such cases lead pipe, the surfaces of which are coated with tin, and my idea was that I had seen such advertised in the BUILDING NEWS. I fail, however, to find it. Will any one please give, through these columns, an opinion as to this solution of lead, and state if they know such tinned lead pipe is made, and who are the makers?—F. H.

[2289].—**Smoky Cottage Kitchen Chimneys.**—In small houses the most convenient range is an open fire cottage range, with oven and boiler; but the open space over the hob admits so much cold air as to check the draught in the chimney and cause it to smoke. The common remedy for this is a tin blower, but this is inconvenient, as it so reduces the height from the hob to the mantel, when down, as to interfere with the removal of saucepans, &c. Can any reader suggest another remedy, such as contracting, by any means, the opening into the flue by means of different construction whilst building, or an iron-formed throat for chimneys already built?—R. A. B.

[2290].—**Constructing Stairs.**—I am about constructing a stair on principle laid down in BUILDING NEWS, and I want to know if it is necessary to give the steps a "drip," as my employer said that all good stairs should be so?—P. P. B.

[2291].—**Cement.**—What kind of cement is best for building in salt water?—P. P. B.

REPLIES.

[2282.]—**Colours Used in Drawings.**—I have tried "F's" colours, but I cannot see that Payne's gray represents Kentish rag, or gamboge Bath stone. I have always been taught that Payne's gray is for slates.—PUPIL.

[2282.]—**Colours Used in Drawings.**—Go over all the stonework of the drawing with a light tint of yellow ochre, then put a broken wash over the parts designed for Kentish rag of warm gray, made by mixing Indian red and indigo, the first wash representing the Bath stone, and forming a harmonising tint to the improvement of the gray wash representing the rubble.—P. E. M.

[2285.]—**An Inquiry.**—The flight of steps in the thickness of the nave-wall of Welsh churches led up to the rood-loft, a fine example of which will shortly be illustrated in these pages.—J. P. S.

[2285.]—**An Inquiry.**—The "small archways" and passage originally led to the top of the rood-screen, which, before the Reformation, extended across the chancel-arch. The top of the screen was called the rood-loft, and as sermons and other addresses appear to have been delivered from thence, and also for the purpose of lighting the candles which stood on it, the aforesaid little arches and flight of steps were necessary.—P. E. M.

[2287.]—**Ice-Well.**—Several modes of building ice-houses have been given in the back numbers of the *BUILDING NEWS*. I beg, however, to send description of another mode, contributed to the American *Technologist* by "W. F. H."—"An ice-house may be economically built in the following manner, and will give entire satisfaction, if the dimensions be not less than 12ft. square by 12ft. high for the space to contain the ice. Presuming that the ice-house is only for family use, select a shady position and dig a cellar 2ft. deep, and let the floor or bottom be properly smoothed off, with a descent of 18in. in the 12ft., leading to one corner. It should be made perfectly water-tight and smooth with a coating of cement, and a wall, also laid in cement, should be erected therein 3ft. high, formed on the top with a rabbet on the inner edge of two sides for the purpose of receiving the joists for the inner lining of the house. Make the size any way you please, only not less than 12ft. square inside; erect on this wall your double frame, carefully boarded with tongue-and-groove boards on the inside, and made as tight as possible. Pack the space between the inner and outer lining with dry sawdust or tan bark up to the beginning of the roof; let the roof be steep, and also lined inside with boards, but not filled, and let a space under the peak be left open 3in. to conduct the warm air to a ventilator on either side of the peak, secured by wide slats in such a position as to make ingress of rain impossible. Another ventilator must be placed in the centre of the peak, the openings of which must be larger in proportion to the house (say 1ft. square inside), and entirely secured against rain. Let the door for filling and taking out be on the north side of the gable, arranged like the roof, not filled, and a drain-pipe of 3in. to 4in., properly cemented, run from the lowest point of the bottom of the pit at least 10ft. (15ft. is better) under ground, with a good descent for taking off the water, and your house is ready to receive the ice, and it will keep it well for all purposes. The filling of the house should be done in this manner: Place at the bottom of the said pit clean corn-stalks 18in. deep, closely packed and levelled; then cut your ice in square blocks, as even square as practicable, and place them on the corn-stalks close together, like tiles in a hall, and when six layers are completed, take a watering-pot with a middling fine nose, and pour clean water gently over all crevices left, until they are closed by the freezing of said water; continue then the filling, repeating at intervals the watering process until you reach the beginning of the roof, then let the ice settle, and, if you find that the crevices have not been completely frozen, choose a very cold day to finish the watering operation. You can then put in ice enough to go half way to the peak, and you can enjoy the luxury of ice until the new crop. To make the handling of the ice easy, have a beam extending 3ft. from the roof outside for block and tackle, and another one inside near the peak for the same purpose, also fix an easy ladder on the inner wall on the side where the door is, and the ice can be nicely removed with the tackle and ice-tongs without any trouble. When taking the ice some distance from the house, it would be advisable to use a blanket to put it in while it is being transported, which blanket should always be kept aired, and should be cleaned every time it is used. Such a building should be painted from time to time on the outside; and, whenever the ice is finished, the corn-stalks should be removed, and the house well ventilated, so as to be free from any unpleasant odours. If so cared for, it will last a great many years, and will require very few repairs."—CYPHER.

MONUMENTS TO MOLTKE AND WERDER.—Monuments are to be erected to Count Moltke at Parchim, his birthplace; to General Werder at Freiburg, the principal town of the Black Forest, saved from invasion by his bravery; and, together with these modern heroes, to Hermann, the great chieftain of 2,000 years ago, who overcame the Romans and freed his country from the then national enemy. The latter figure, which is to be in chased copper and of gigantic proportions, will be put up on the very battlefield where Varus' legions were destroyed, in the midst of the Teutoburg forest, near Detmold.

LEGAL INTELLIGENCE.

THE ALLEGED MANUFACTURING NUISANCE.—Mr. W. O. Callinder, the manager of the Val de Travers Asphalt Paving Company, attended on Wednesday to an adjourned summons, at the instance of the Greenwich District Board of Works, charging him with carrying on the business of the company on a piece of land between the river Ravensbourne and Deptford-bridge so as to be a nuisance and dangerous to the health of the inhabitants, as certified by Mr. Pink, the district medical officer. The case was reported last week. It will be recollected that the nuisance complained of was from thick white vapour and steam escaping from open and also from fixed cauldrons into the air of a densely-populated neighbourhood, causing nausea and sickness to the strong and healthy, and irritation and cough to the weakly. There were about a dozen witnesses called to speak to the above effect, and the further hearing of the case was adjourned until Wednesday, on the understanding that only the two fixed cauldrons should be used until the best practicable means were used to prevent the nuisance, and an undertaking being given that if the works were then considered a nuisance they should be removed altogether out of the district. The nuisance, it was now stated, still existed, and in support of which Dr. R. Mitchell and Dr. E. Downing, of Deptford, were called, and spoke to attending the families of different Deptford tradesmen, through ill-health consequent upon the smells from the manufacture carried on.—Mr. Poland admitted that he could not struggle against an adverse decision, under the 27th section of the Nuisances Removal Act, that at the time the summons was applied for and granted the best practicable means to prevent the works becoming a nuisance had not been taken. The company had, however, as soon as complaints were made by the inhabitants, determined that the nuisance should be done away with, and the whole of the open cauldrons had been removed and the chimney shaft, from which the vapour or steam escaped, heightened. As to the future, the managers of the company felt that, with the aid of scientific knowledge now possessed, although expensive of application, the works can be carried out without the slightest nuisance to the inhabitants.—Mr. Patteson said he felt bound to convict, and imposed a penalty of £5 and £15 costs.

Our Office Table.

THE NEW SUBWAY AT BLACKFRIARS STATION.—In consequence of the extensive works now in course of construction at the Blackfriars Station and approaches the company has been obliged to inclose Holland-street, which it intends to absorb into the goods station. Although, however, the company under their parliamentary powers are enabled to do this, they are at the same time providing for pedestrian traffic, by the construction, under Holland-street, of a subway under Blackfriars-road to the point on the east of the station where Holland-street is continued in a north-easterly direction. The subway is about 83 yards in length, four yards in width, and upwards of six yards in depth from the street level to the footway below. It will be approached from Blackfriars-road and the east side of the railway by a wide and commodious flight of steps. The entire length of the subway has been completed, and the approaches will shortly be finished, when the street will be closed and the subway opened for foot passengers only, the company having provided for vehicles by constructing a new street, diverting Holland-street into Southwark-street. The whole of the works will shortly be completed.

DOUBLE ACTION ADJUSTABLE SPRING HINGES.—Some improvements effected in spring hinges by Mr. Douglas Mole, of Blackfriars-road, London, are deserving of notice. The three principal advantages attained by the use of the new hinge are, 1st, the ability to adjust the door to any centre after the box is fixed, thus causing a great saving of time; 2nd, the avoidance of the old plan of taking up the box to readjust the spring (which must be done with any other hinge); and 3rd, that each portion of the hinge is made to a standard size, and is therefore interchangeable and easy of removal for cleaning and repairs.

COMPLETION OF SOUTH LONDON TRAMWAYS.—The several lines of tramway along some of the principal thoroughfares in South London, which have been in course of construction during the last six months, are now almost entirely completed, and we understand that it is intended to open them for traffic on the 1st of September. These several routes include a line from Blackfriars Bridge, along Blackfriars-road, London-road, to the Elephant and Castle, and in continuation along the Walworth and Camberwell roads, to Camberwell Green; also a line

from Vauxhall and Pimlico, along Kennington Oval to Kennington Church, and thence along Camberwell New-road to Camberwell Green; also another line along the New Kent-road, from the Elephant and Castle to the junction of the Old Kent-road and Greenwich line. At the large open area known as S. George's Circus, where the Blackfriars-road, London-road, Borough-road, Lambeth-road, and the Westminster-road converge, a circular and connecting series of lines have been formed, and at this point the several lines have been connected by branches with the Westminster-road and Brixton and Clapham lines. On the opening of these several lines, the aggregate length of tramway traffic in the South London district, including the Westminster and Clapham and Brixton lines already open, will be upwards of twelve miles in extent, which will shortly be increased to about fifteen miles, on the further extension of the system from Camberwell Green to Greenwich, *via* New Cross. With the exception of a short length in the Camberwell New-road, near the Green, which it is expected will be finished in the course of a few days, all the lines are ready for opening. It is stated that for the privilege of passing over Vauxhall Bridge the Tramway Company is to pay a toll of £2,000 a year.

TRADE FESTIVITIES.—On Saturday week the workmen in the employ of Messrs. Mansfield & Sons, decorators, of Sise-lane, Bucklersbury, had their annual dinner at Roydon, Essex. On the same day, the *employés* of Messrs. David King & Son, builders, Aldgate, dined at the Rye House. In the absence of Mr. King, *senr.*, through indisposition, Mr. Ball presided, the vice-chair being taken by Mr. Thomas. The workmen employed by Mr. W. R. King, builder, of 19, Minories, on the same day held a festive gathering at Cophall Farm, on the borders of Epping Forest, under the presidency of Mr. King.

S. ANDREW'S-STREET, HOLBORN.—This new street (a portion of the Holborn Viaduct Improvement), which leads from Holborn Circus to the junction of Farringdon-street with Fleet-street and Ludgate-hill, is in a very forward state. The sewers have been finished, and subways have been constructed for the gas and water pipes. The upper part of the street, near S. Andrew's Church, is paved with granite setts, laid on a solid bed of concrete, and at the lower end, towards Ludgate-hill, preparations are being made for laying the foot pavement. To suit the level of the new street, Stonecutter-street, Shoe-lane, and Little New-street are being re-levelled.

PROPOSED NEW THEATRES IN LONDON.—We understand that the International Opera House scheme, which we referred to a few weeks ago, is now definitely settled. The site of the new theatre is situated in one of the best parts of Oxford-street, and the building itself will be elegant and commodious. The architect is Mr. Walter Emden. It is again stated that Mr. J. A. Cave is going to sell the Victoria Theatre, Waterloo-road, of which he is the present lessee, to a limited company, and that Mr. Cave intends erecting a new theatre in the Edgware-road, from plans prepared by Mr. Walter Emden, architect. The theatre will be constructed to hold about a thousand people, with entirely new arrangements for the public comfort.

THE BED OF THE TIBER.—The scheme of a thorough excavation of the bed of the Tiber has been taken up by an Italian association, at the head of which is the well-known Signor Alessandra Castellani, but which relies on the co-operation of many artists, antiquaries, and other learned men of Europe and America, all of whom have been strongly urging the speedy commencement of an undertaking which has already been too long delayed. Those who set about it expect no other return for their trouble and expense than the immense gain sure to accrue from it to art and history—to archaeological knowledge in all its branches.

THE NEW POST OFFICE BUILDINGS IN S. MARTIN'S-LE-GRAND.—A grand new edifice is rising in S. Martin's-le-Grand, for the purposes of the Post Office, opposite the well-known central office, which is considered one of Smirke's best works. It will be supposed, of course (says the *City Press*), that the design of the new building is sufficiently vast to cover the business which has outgrown the old familiar office, and that the department will be sufficiently housed for many a year to come. Now, it strangely happens that, extensive as the new scheme is, the postal business, of which it is to be the centre, has outgrown the capabilities of the site even while the foundations of the new office have been in progress. On the day that the new building is dedicated to its proper uses, another of equal, or even greater dimensions, will be needed, and, in respect of house room, the Postmaster-General will be

the counterpart of Mr. Briggs on a large scale, and in quite a serious way. The authorities already pay £3,000 a year rental for additional premises in the neighbourhood of S. Martin's-le-Grand, and at the completion of the new building this expense is likely to be increased, instead of terminating altogether.

PRECAUTION IN THE CITY AGAINST DISEASE.—The City Commissioners of Sewers have, by a widely-circulated notice, drawn the attention of inhabitants and owners of houses within the City to the various legal provisions made with a view to prevent nuisances, and consequently disease. They recommend families freely to use chloride of lime and carbolic powder in their houses, and request that everywhere the utmost cleanliness should be observed in respect of the condition of areas, basements, cellars, kitchens, and all damp and dark places. They also warn people not to allow the accumulation of rubbish, and to be careful as to the state of their waterbutts and cisterns.

Chips.

A new (Roman) Catholic Chapel dedicated to Our Lady and S. Osion, and accommodating 140 persons, was opened at Tynemouth on Tuesday week.

It is rumoured that Miss Garrett, daughter of Mr. Newson Garrett, of Suffolk, and a younger sister of Mrs. Fawcett and Mrs. Anderson, has determined to devote herself to house decoration.

At the meeting on Monday of the Val de Travers Asphalt Paving Company (Limited) it was decided to divide as profit amongst the proprietors shares in the Manchester, Scotch, and Irish Val de Travers companies to the amount of £50,000, and to subscribe for 5,850 shares in those undertakings at the price of £5 per share, or par.

At the pits of the Newark and Vale of Belvoir Plaster Company's works, near Newark, on Saturday, part of the top of a tunnel in which several men were at work fell in. A man named Henry Thompson was killed and four others injured, one of them seriously.

The inauguration of the Mont Cenis Railway will take place on the 11th of September. The Ministers of France and the leading engineers of that and other countries have been invited to be present at the ceremony.

The honour of knighthood is to be conferred upon Mr. John Gilbert, R.A.

At Wansbeck, near Morpeth, last week, an iron suspension bridge over the river gave way under the weight of a large crowd, and about a hundred persons were thrown into the water, many of whom were severely injured.

The foundation-stone of a new hospital for the west end of Glasgow was laid a fortnight ago. The new hospital will be 1,000ft. distant from Glasgow University, will consist of ten pavilions (one of which will be used as a theatre for clinical instruction), and will contain 332 beds.

We understand that Mr. A. R. Barker, architect, has been appointed surveyor in the Diocese of Winchester, under the Ecclesiastical Dilapidations Act, 1871.

On Tuesday week the Bishop of Ripon consecrated a new church and an additional piece of land to be used as a burial ground at Thurgoland, near Sheffield.

The Marquis of Westminster laid the foundation-stone of a new church at Brymbo on Tuesday week.

The Bishop of Winchester, on the 8th inst., opened the new buildings of Reigate Grammar School, which have been erected at a cost of £3,000.

The Bishop of Winchester laid the foundation-stone of a new school at Shanklin, Isle of Wight, on Saturday week.

The trustees of the British Museum have purchased twelve vases recently found at Capua. They are principally amphoræ of a rare and beautiful kind, large in size, fine and varied in form, with black figures, and are assigned to an epoch a little later than Alexander.

A new iron pier is in course of construction at Lambeth, in place of the timber one now in use.

A new Independent church is to be built on a site in Clapham-road, at the corner of Jeffrey's-road.

The Mercers' Company has contributed fifty guineas to the fund for the completion of the National Sanatorium for Consumption and Diseases of the Chest at Bournemouth.

The church of S. Michael, Bassishaw, is closed until the 10th of September, to admit of its being "renovated."

The Corporation of Leicester have decided to erect a fever hospital in that town, according to the requirement of the Privy Council, and have appointed Mr. Thos. Barnard, of Leicester, architect for the new building.

The interior of S. Clement's Church, Eastcheap, being about to be remodelled, photographs of the building in its present state have been taken. It is to be hoped that when alterations are made in other City churches the example set by the authorities of S. Clement's, in securing a permanent record of the appearance of the building, will be followed.

Timber Trade Review.

PRICES, 21st August.—Timber per load of 50 cubic feet:—Quebec red pine for yards and spars £3 15s. to £4 15s.; ditto mixed and building, £2 15s. to £3 5s.; ditto large yellow pine, £4 5s. to £5 5s.; S. John's and Board pine, £4 to £4 15s.; Building sizes, £3 5s. to £3 15s.; Pitch pine, £3 10s. to £3 15s.; Quebec oak, £6 to £6 5s.; Rock elm, £3 10s. to £3 15s.; Ash, £3 10s. to £4 15s.; Large yellow pine masts, £4 to £5 10s.; Oregon ditto, £7 to £10; New Zealand ditto, £6 to £7 10s.; Quebec large Birch, £3 15s. to £5; New Brunswick and Prince Edward's Island ditto, £2 15s. to £3 10s.; Small averages, £2 10s. to £3 5s.; Indian Teak, £12 5s. to £13 10s.; African Oak, £7 to £8; British Guinea Greenheart, £5 10s. to £6 10s.; Cuba Sabicu, £8 to £9; Australian Ironbark, £6 to £6 10s.; Wainscot per 18ft. cube, Riga crown, English and Dutch, £3 17s. 6d. to £5; ditto black, £2 17s. 6d. to £3 5s.; Memel and Dantzic crown, £3 15s. to £4; ditto black, £2 to £2 7s.; Flooring Boards per customary square of 1 inch. First yellow, 8s. to 10s.; white ditto, 8s. to 9s.; second qualities, 6s. to 8s.; Matched Boards per square 3in. and 4in., 5s. to 8s.

Mahogany, per foot, superficial Honduras (cargo average) 5½d. to 6d.; Mexican, 5½d. to 6d.; Tabasco, 6d. to 6½d.; Cuba, 7d. to 10d.; St. Domingo, 7d. to 10d.; Cuba, 1s. 4d. to 2s.

Cedar, per foot, superficial, Cuba, 6d. to 7½d.; Honduras, 5d. to 5½d.; Pencil, 2d. to 4½d.

Trade News.

WAGES MOVEMENT.

NEWCASTLE-ON-TYNE.—The master builders and joiners of Newcastle and Gateshead have declared that the strike of the joiners and house carpenters in those towns is at an end. The men struck for the "nine hours," but the masters resisted, and imported workmen from Belgium. The strike lasted nearly five months.

END OF THE DUBLIN STRIKE.—The Dublin carpenters, who have been out on strike for eight weeks in order to obtain an advance of 3s. per week, have accepted a compromise of 2s., and have resumed work on those terms.

BERLIN.—At a general meeting of the Association of Carpenters held in Berlin on Monday, it was decided to stop work until the masters agreed to give a rise of 25 per cent. in the wages, and to a reduction of the hours of labour to nine and a half.

STRIKE OF SLATERS AT NEWCASTLE.—The slaters are out on strike at Newcastle for an advance from 28s. to 30s. per week.

TENDERS.

CAMBERWELL.—For a new infirmary for Camberwell Union. Drawings prepared by Mr. W. S. Cross, architect. Quantities by Mr. W. F. Meakin:—

	Amount of Tender.	Credit for Old Materials.
Stephenson	£18,774	50 0 0
Smethurst	18,650	35 0 0
Wignmore	18,450	50 0 0
Newman & Mann	18,315	30 0 0
Philip Stiff	18,200	20 0 0
Tarrant	17,990	25 0 0
Crockett	17,900	50 0 0
Hill, Keddell, & Waldram	17,675	50 0 0
Mann	17,645	25 0 0
Capps & Hitts	17,642	30 0 0
Perry & Co.	17,610	20 0 0
Howard & Co.	17,460	20 0 0
Thompson	17,420	35 0 0
Chappell	17,413	36 15 0
W. Culham	17,150	65 0 0
Till	17,090	30 0 0
Leatherdale & Son	17,071	75 0 0
Hughesdon	17,000	70 0 0
Cooper	16,900	52 0 0
W. & P. Croaker	16,629	27 0 0
Hart	16,565	75 0 0
Dover, Dowell, Wills & Co.	16,513	89 0 0

KENSINGTON.—For new buildings in Ball-street, in connection with Nos. 38 and 39, High-street, Kensington. Messrs. James Broadbridge and Jonah Houle, architects:—

Cowland	£3200
Hockly	3100
Temple & Forster	3075
Stimpson	2995
Servener and White	2988
Hussey	2975
Cooke & Green	2971
Langmead & Way	2875

KENT.—For rebuilding mansion, &c., near Penshurst. Kent. Mr. E. P. Browne, architect. Quantities supplied by Messrs. Geo. Lansdown & Pollard, and Mr. W. E. Stoner:—

J. S. Ancombe (accepted)	£17,872
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This amount is exclusive of foundations, bricks, lime, and sand, which are found by the proprietor.

LONDON.—For alterations and additions to No. 33, St. James's-place, St. James's-street, for W. C. Gainer, Esq.

Mr. Thos. Dudley, architect. Quantities supplied by Messrs J. & A. E. Bull:—

M'Lachlan (accepted)	£1027
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LONDON.—For alterations and additions to the University Club, No. 71, Jernyn-street, St. James's-street. Mr. Thos. Dudley, architect. Quantities supplied by Messrs. J. & A. E. Bull:—

Newmann & Mann	£3341
Kelly Bros	3319
Williams & Son	3234
M'Lachlan	3194
Robt. Mann	3185
Cooke & Green	3166

LONDON.—For a warehouse, Bow-lane and Watling street, E.C. Mr. Herbert Ford, architect:—

Myers & Sons	£5100
Perry & Co	5041
Gammont & Son	5027
Morter	4967
Kilby	4897
Colls	5865
Brown & Robinson	4810
Corder	4756
Kelly	4750
Turner & Son	4695
Stimpson	4637
Henshaw	4563
Perry Bros	4377
Brass (accepted)	4336

LONDON.—For alterations and decorations to a warehouse, Love-lane, City, E.C. Mr. Herbert Ford, architect. Henshaw & Co. (accepted.) £346

NEW MALDEN.—For the erection of boys' school, classroom, and other works for the district of Christ Church, New Malden and Coombe, Surrey. Mr. H. T. Freshwater, Architect:—

Walling Extra.	
Poskett & Taylor	£499 0
Rudkin	473 0
Rooney Brothers	340 0

Walling Included.	
Eydman	500 0
Spauring and Stewart (accepted)	423 18
Taylor	415 0
Crowe	413 0
Roberts	400 0

READING.—For new Lecture-hall and buildings, Abbey, Reading for Messrs. Sutton & Sons. Quantities supplied. Messrs. Wm. & J. T. Brown, architects:—

Matthews	£1957 0 0
Strong & Son	1947 18 0
Woodruffe	1883 0 0
Sheppard	1877 0 0
Dunn	1845 0 0
Barnes (accepted)	1671 18 0

WATFORD.—For sewers and roads on the Watford Town Estate, for the British Land Company, Limited:—

Wignmore	£1050
Pizzey	899
Campkin	880
Holloway	795
Bloomfield	777
Young & Jarman	745
Hubbard	637
Pearson	675
Haynes Bros	580
Riley (accepted)	555

CONTRACTS OPEN FOR BUILDING ESTIMATES

ABERGAVENNY UNION, August 30.—For the erection of infirmaries and fever wards, and sundry other additions and alterations at their workhouse.—William F. Batt, Clerk to the Guardians, Union Office, Abergavenny.

BISHOP'S STORTFORD NATIONAL SCHOOLS, August 31.—For the erection of new school-rooms on a piece of land near S. Michael's Church.—George Perry, Architect, Bishop Stortford.

LEEDS, September 1.—For the erection of six houses, coach-houses and stable and out offices.—J. Hall, Architect, Belgrave-chambers, Leeds.

LEEDS, August 28.—For the erection of chambers in Cookridge-street.—H. Walker, architect, 11, East Parade, Leeds.

MANSFIELD CO-OPERATIVE INDUSTRIAL SOCIETY, LIMITED, September 5.—For the erection of a corn-mill.—R. Ginthorpe, Secretary.

SALFORD, August 31.—For sewerage, levelling, and draining Plymouth-street.—E. Andrew, Clerk, Town Hall, Salford.

HORNSEY LOCAL BOARD OF HEALTH, August 28.—For the construction of an outfall sewer, in connection with Metropolitan Northern High Level Sewer, with the internal sewers, for the sewerage of their district.—Wm. Hammond, clerk of the board, 16, Farnival's-inn, Holborn, E.C.

ROWLEY REGIS LOCAL BOARD, September 2.—For sewerage, levelling, paving, flagging, and channeling Black Wagon-street, within their district.—Arthur Wright, Clerk to the Board, Board Room, Rowley Regis.

WILTON (Wilts), September 2.—For the supply of pipes, and the reconstruction therewith of about 2,500 feet of 10in. and 9in. pipe sewers, and the branch drains in connection with the same.—Thomas Thring, Clerk to the Local Board, Wilton, near Salisbury.

BRISTOL LOCAL BOARD OF HEALTH, August 31.—For reconstructing and finishing a brick sewer, and other works in "The Avon Intercepting Sewer District." Length of Sewer about 242 yards, size, 3ft. in. high by 3ft. wide.—John G. Heaven, Clerk, Local Board of Health Office, 13, Prince-street.

THE BUILDING NEWS.

LONDON, FRIDAY, SEPT. 1, 1871.

THE CATHEDRAL OF COLOGNE.

THE double work of restoring and completing this splendid structure goes on, we regret to learn, but slowly. From recent numbers of the *Domblatt*, or "Cathedral Leaf," a journal expressly devoted to this one subject, and which empties all its profits into the subscription box, we learn that scarcely any stone was put in, scarcely any money collected, scarcely any work done last year. That, however, need not be a subject of surprise. War and preparations for war do not belong to the harvest times of art in any country; and the mighty shrine of Cologne naturally stood neglected while diplomacy first, and battles afterwards, absorbed the anxieties of Europe. But it is nothing less than marvellous that the Germans—a people of so much national pride—should exhibit apathy, and even parsimony, in respect of their magnificent temple—the crown of all Gothic in continental Europe. Yet so it is. A destiny would almost appear to hang about the building, as though it would never be finished, and as though while the new sprung up the old were foredoomed to decay. We have to remember, in fact, that this is the process actually going on. Month by month, as the central tower of iron rose from its four sustaining pillars, deep-rooted in the earth, through the roof and up, in perfect grace and lightness, to a stately and airy height, the grand portico was literally mouldering, and dropping in minute fragments to the ground. The fault lay with the original constructors, who quarried for their stone in the soft and porous cliffs of the Seven Mountains, and, more particularly, among the friable strata of the Drachenfels. Materials of that kind were not calculated to endure for ages, as is testified to by the incessant patchings which the robber knights and feudal princes of the Rhine had to bestow upon their castles, and the rapid crumbling of these edifices after being once abandoned by those who had an interest in preserving them. In fact, were it not for the tourists, who supply an incentive to the conservators guarding the picturesqueness of the Fatherland river, the ruins themselves would speedily be ruined, and sink down in shapeless masses on the rocks. This cause partly accounts for the dilapidation of the incomparable cathedral which adorns, even in its incompleteness, the most important city of Rhenish Prussia—a province overwhelming with wealth, though begrudging the cost of terminating that task which artists and monarchs gloried to contemplate six centuries ago. It is disheartening even for the stranger, who cannot be supposed to share the German pride in this sumptuous trophy of time, to revisit the City of the Three Kings: to revisit, autumn after autumn, and perceive the same melancholy signs of indifference and lassitude—the paltry heaps of unhewn stone, from Andernach and Treves, on the terrace; the sawing and sculpturing yard, unworthy of a third-rate Thames-side contractor; the meagre scaffolding; the few stragglers on the roof; and, above all, the inferior, rough, spiritless, characterless work employed. Within there is an appearance, but only an appearance, of greater activity. That is to say, the perspective is ruined, as it has been for years past, by forests and frames of timber; and the wondrous beauty of the choir is threatened with the heavy tone of nineteenth-century restoration, when it needs no touch whatever, except for the replacing of certain fallen fragments. But a fragment takes a long time to replace in the Cathedral of Cologne. On October 17th, 1834, one of the pinnacles of the gallery running round the vault above the Chapel of the Magi fell

down; on October 17th, 1834, four hundred years later exactly, it was restored. That is about the rate at which things do move in the capital of the Eleven Thousand Virgins. Passing through the portal, the sculptured beauties of which are rapidly exfoliating themselves out of form, we glance up, as far as may be, through the twilight interiors of the towers, which are to be five hundred feet high, and have not risen a foot for centuries past. They are choked with scaffolding, and not the sound of a hammer, or a chisel, or a trowel, or a man's voice, is heard. You inquire of the sacristan, "When are the workmen here?" "They will be here when there is money to pay them." You may easily believe it. The *Cathedral Gazette* announces the week's subscriptions to the fund for carrying on this universal German labour of love—they amount, perhaps, to ten-and-sixpence! and this is no exaggeration. It is clear that the heart of Germany is not in the giant Dom of Cologne. A quarter of a century has elapsed since a prodigious noise was made, calling upon the entire Fatherland to rescue its proudest monument from the wasting influences which were reducing it to the skeleton of its former self. It had gone on growing through generations. The plans of its unknown architect were taken up—a bit added here and a bit there—and laid aside again. In one reign a few statues were installed in their niches; in another a painted window threw its gilded and jewelled light upon the fractured floor, making it all one treasure; in a third a patch was put on the roof, or a figure graven for a tomb, to catch the same ruddy and amber rays athwart some saintly face. But at length, fifty years ago, the Germans began to profess themselves ashamed of the sight that was to be seen in the opulent city of Cologne. *Reich wie ein Kölner*—rich as a Cologner—had long been a popular saying. The spectacle was, indeed, to be lamented. Much of the interior was only sheltered by a wooden roof; the side aisles were not vaulted in; the two great gables of the north and south front were fragments, though fragments of superb designs, surmounting every other stone structure in the city; a part even of the exterior wall was wanting; only a few of the buttresses stood firm; the nave had to be re-roofed and vaulted; the cross gallery, with its pinnacles and gables all lovingly indicated in the plans of the unknown architect, had never been erected; of the parts that had been finished the finer traceries and mouldings were disappearing in decay; the exterior sculpture exhibited signs of honeycomb; total destruction, indeed, seemed to impend over the finest structure in Germany, even before it stood as a completed edifice at all. When the architects were called in they reported a degree of unsoundness, ricketiness, and dilapidation by thieves, who had stolen the leaden roofs, besides robbing the altars, that an immediate expenditure of £30,000 was necessary to prop the tottering parts. But the unknown architect was a Titan in his ideas, and what he built of the towers—unsunk and unshaken now—were really intended to bear, and can bear still, the weight of an additional three hundred feet, ponderous and massive, which he contemplated rearing upon the two hundred already erect, huge, upright, unshaken by time and tempest, solid as rocks—the protectors of that glorious portal beneath whose arch many a noble church might stand, with plenty of place above the spire.

The German Governments, or rather those of Prussia, Wurtemberg, and Bavaria, at last felt compelled, for the honour of a nation which is nothing if not boastful, and has many reasons for boasting, to meditate upon a systematic plan for saving the Cathedral. Little importance can be attached to their resolves, however, until the year 1842 was reached. Then was constructed the machinery which, feebly and spasmodically, is still at work. King Frederick-William IV. became a patron,

and laid a new foundation-stone, as though the labours of four hundred years were beginning over again; and the Dombauverein, or Cathedral Union, with a thousand affiliated smaller unions ramifying through the land, was established. It was agreed, in a moment of unmeasured enthusiasm, that Cologne Cathedral should be regarded as a symbol of German unity. By the introduction of this political idea the progress of the task was retarded. Only Munich and Wurtemberg, where German unity is scarcely as yet recognised, contributed generous subsidies. But the eagerness of the people was kept up at white heat for a time. The King put himself down for an annual subscription of £1,500; the societies collected funds; lectures, sermons, festivals, were drawn upon as so many sources of help; strangers were pitilessly sentinelled until they dropped money into the boxes padlocked on every door; and, when nearly twenty years had elapsed, results were visible. Among others, a million of thalers, or a million of coins worth three shillings apiece, had been spent. The choir was finished, and its harmony slightly marred. The columns of the nave had been carried up to their destined height, with a less flagrant departure than might have been expected from the original design. The vaulting of the roof was in a fair way towards completion. The two hundred feet of tower had been surveyed, and pronounced not less solidly-set in the earth than Ehrenbreitstein itself, and the *Domblatt* had commenced its appeals to the entire Catholic world to aid in the holy triumph at Cologne. But one singular influence was hostile to the Cathedral Union and the Cathedral "Leaf." It is a proverb throughout Rhenish Prussia, and far beyond it, that Cologne Cathedral will never be completed, though, in order to the fulfilment of this prediction it was not necessary to leave it as Napoleon's General found it when he, without the least irony, complimented the inhabitants of the city upon their "magnificent Gothic ruins." Still, the labourers were not altogether idle. They declared, eight years ago, that the interior only wanted a finishing touch. It wants a good many, at any rate, now. It is true that the barbarous partition separating the choir from the nave has at length been removed, so as to afford the hope of an unbroken perspective before long; and even that every now and then, as if by magic, all the inside scaffolding disappears, when grand ceremonies have to be performed; but a pilgrimage through the splendid spaces, and still more splendid recesses, of this surpassing edifice, proves that no part of it can yet be called perfect, unless it be the genius that lives in the whole. Nor need we wonder. With all the hubbub, the celebrations, the songs, the appeals, the local organisations, the patronage of princes, the mendicant missions abroad, the countenance of the Pontiff, the pride professed by Germany, and the periodical exaltations of the *Domblatt*, we doubt whether any sum approaching to three-quarters of a million sterling English has been expended upon the work from first to last, notwithstanding that the structure was to be adopted as a symbol of German greatness and unity. One thing, however, the restoring architects did accomplish three years ago, and every German, whether or not he had or had not subscribed to the Cathedral Restoration and Completion Fund, anticipated that, forthwith, the towers would rise to their predetermined loftiness of five hundred feet above the mound in the Marz Platz, whereon, tradition records, Agrippina's Roman veterans encauped. They hauled down, in 1868, the ancient and remarkable crane on the south tower, which, for centuries, had been a landmark of the crescent-shaped city, especially from the river. They might have left it until there was masonry to put in its place. Many a tourist, wearying his eye for the cathedral, first caught sight of the old well-known black crane, with its grotesque framework and its

beam slanting upwards like a bowsprit. It has disappeared, and, let us hope, is in some museum, for it was probably the only genuine specimen extant of the cranes employed by the builders of the middle ages. That its power was immense is demonstrated by the masses of stone which it must have lifted; but, among all the florid histories of the Cathedral with which German handbook literature abounds, we have met with no description of its mechanical principles. As for Schlegel, he, of course, regarded it as no part of his subject, and so soared from the crane into the entities. After their war, however, and the accomplishment of their unity, of which, despite prophecy, the Cologne Dom was not to be a symbol, we may hope for more rapid advances. For the sake of the choir and the majestic south portal alone, if not for the sublime design of the towers and the luxury of art-thoughts which must have been amassed in the mind of the architect when he traced those aspiring pillars, those wondrous flying buttresses, those giant piers, that dream of purpled pinnacles, and those casket-like chapels which are jewels holding gems. But, it must be repeated, while the new is created the old is perishing, and the old means that which was truest to the typical hope of the founder. For, anxious and conscientious as the first generation of toilers may be, they devote themselves to their cathedral in an inevitably modern spirit. It is not to them a passion which they yearn to perpetuate by a monument; they labour upon lifeless stone, that refuses to become animate beneath their hands. It is not the pious Parnassus of their ambition; it is little sacred, little loved, little revered; it is the world-renowned Cathedral of Cologne, which really must be finished, or it will grow into a scandal. These considerations, forcing themselves upon us, do not justify very exalted hopes. It may even be imagined that the Dom, the ancient of ages, would have been more beautiful and more hallowed as a ruin than it will be when the thrifty German people have counted out thalers sufficient for its completion. Nevertheless, Germany is doing right in attempting, with however half a heart, to prevent any such catastrophe; for though it might not impair the splendour of the shrine in the eyes of those for whom every Basilica upon earth is a shrine, the disgrace to the nation must have been indelible. What inspirations of different times, what labour of numberless hands, what emulations of artists, what struggles against the effects of decay and ravage, do these ascending piles, raised upon such deep foundations, as though the architect had dreamed of immortality for them also, represent. They may be somewhat vulgarised by nineteenth-century contracts and repairs; yet, taken for all in all, it is better that a people pretending to greatness should be careful of its sacred monuments, however tardily or slowly, especially when they assume such forms of religious grandeur as Cologne Cathedral, than that they should only admire them as they crumble, and dedicate their purses to the extinction of the arts—a project which is among the latest ebullitions of the Teutonic philosophy. So far for the story of a German architectural “restoration,” not yet half on its way to be finished.

REVIEWS OF RECENT BUILDINGS.

VI.—MIXED STYLES.

A VERY large proportion of modern work, as every one knows, is assignable to no definite style. It is Gothic modified by Classic, or Classic by Gothic, or either of them changed and added to by the individual taste of each special designer. In the abstract we are far from condemning the spirit of innovation. No past style exactly suits us or quite expresses our aims and feelings. We must adapt it, and widen it, and add to it before it is capable of supplying our everyday wants and of dealing with those

thousand details of modern life for which no ancient parallel exists. The difficulty is, to make our additions harmonise with the original; to preserve the unity of the style on which we experiment; to interweave our additions so skilfully that they may not appear as patches and excrescences. This is the weak point in the half-and-half architecture of the day; its two halves no more unite than oil and water. The best that can usually be said of it is that it is an attempt towards a desirable object, though it often ends in total failure. Too much of it, indeed, looks like the blind groping of men who are dissatisfied with existing styles—they do not know why—and who would fain strike out for a new one—they do not know of what sort. If they can only hit upon some form or some combination that was never hit upon before, very likely this will prove the germ of that new phase of art we are all in quest of, and they will have the glory of originating it. We have seen, however, in the last few years a great many novel and astonishing combinations, a great many original and eccentric details, but the new epoch seems as far off as ever. Perhaps, after all, the haphazard way is not the best one; perhaps we might be more likely to find a modern style if we knew what to look for, or to invent one, if we had first decided to what subjects invention should be applied. In other words, if we could take as a basis whatever existing style (as, for instance, the earliest Gothic) appeared to be the nearest to what we want; if we could then settle clearly what parts of it were unsuitable to any or all of our purposes, and if we could lastly proceed to change these details for more appropriate ones, which would harmonise equally well with the rest of the style, we should, by a much less ambitious method, be making much more real progress. The modifications might be small and gradually applied; but if they proved useful they would spread. No one man, it is true, would become illustrious as the originator of a new style; but then we very much question whether any one man will become so on any system, or ever did become so since the world began. It is only by a multitude of minds working together, accepting the same main principles and aiming at the same ends, that so great a work can be accomplished; and the amount of force now being wasted in isolated and ill-directed effort is something lamentable.

The work we have now to notice, No. 65, Cornhill, designed by Mr. F. Anson, is a favourable specimen of its class. But for two or three of its details, it might be described as in a round-arched variety of Gothic. It is carefully studied, and generally harmonious in its parts; sufficiently fresh in conception to be striking, and yet free from the desire of novelty as a final end. Shut in between tall buildings on each side, there is little of it visible besides the front, and a long and somewhat narrow strip of wall is nearly all that the architect had to deal with. He has, however, been wise enough to display the roof, to introduce a real eaves-cornice and not a disguised parapet, and to relieve the sky-line by what might easily have been an admirable finish to the whole, in the shape of a large dormer. This, however, as we may have to notice, is, unfortunately, the most discordant and least satisfactory feature in the design. Between the street level and the roof, there are five stories. They are marked off on the façade by strings, and each of them is slightly shorter than the one below it. The ground floor is occupied by a shop. Here the angle piers are of granite, brought to a smooth face, but not polished. A rounded corbel projects from the pier on each side, supporting a light iron girder with its web pierced in open-work patterns; and on this girder rests a red granite lintel running right across the front. So far there are no mouldings or ornaments of any kind. The girder, which is visible, cannot be the real support of the wall; it is

too small, too thin, and too much perforated. The design of this lower story, though it is by no means conspicuously offensive, is not to be called successful. But how many shop fronts can be found, of proportions like the present, whose design is successful? The difficulties connected with them are immense the conditions which the architect has to comply with make his task almost hopeless. He is bound, in the first place, to put his widest opening at the bottom, instead of the top of the wall, and bound to make it so wide that scarcely any angle piers remain. Still, if this were all, he might contrive a fair solution of the problem, by turning, as at Mr. Blomfield's offices in Chancery-lane, a great circular or pointed arch from pier to pier. But a far worse restriction is added, when, as seems in practice to be the ordinary case, he is compelled to carry up the shop window straight and square to the floor above. The shop front, is, in fact, settled for him. He is no longer the designer, as far as the ground floor is concerned; the work is already designed, and he has only to make its construction possible. This is the true secret of failures in shop architecture, and instead of asking why our architects can never produce a tolerable shop, it would be more reasonable to ask why they are never allowed the opportunity. In the present case a granite lintel is introduced which appears to carry the four-story wall above, but which obviously could not be trusted even to carry itself across such a span. The actual support of the wall, whatever it may be, remains invisible. It is seldom satisfactory, however, thus to conceal important pieces of construction. To see a great overhanging mass balanced in the air, we know not how, is far from producing pleasant sensations; and though reason may assure us of its safety, the artistic sense demands that its security should be made manifest. This is one ground on which we object to the impossible lintels of stone and granite which have lately come into fashion in these situations. But there remains another one. Even if we could persuade ourselves of their utility—even if we could, by a strong effort of imagination, credit a shallow bar of stone with cohesion enough to stretch across a space of 10ft. or 15ft., the story so bridged would still fail to harmonise with the arched ones. If a flat stone will cover the wide opening of the shop, why not use flat stones to cover the narrow openings of the windows? Mixed construction has generally something jarring and discordant about it, and the most perfect architecture, with few exceptions, is that which confines itself either to the arch or the architrave, as the case may be. But if the two systems are to be united, the natural course, and that, therefore, which is artistically best, is certainly to use arches for the great spans and architraves for the small ones. On both those grounds we think that either the arch or a combination of arch and girders will after all prove the best means of covering these disproportionate openings. But while tenants and building owners fix the shape and dimensions of them as rigidly as they seem to do at present, any great success in shop architecture seems to be out of the question.

Leaving the ground story, however, we come to the house elevation—the part in which the architect may be supposed to have had his own way. There still remain four stories between the shop front and the eaves cornice. Of these, the three lower ones are each lighted by an arcade of three semicircular-headed windows, while the highest has five narrower arches in a row. The materials used are chiefly white brick and red and white terra-cotta. The voussiors of the arches have a peculiarity which may have been suggested by those in the well-known tower of La Martozana, at Palermo, where a similar form is adopted with good effect. They are rounded at their inner extremities, and so when placed together, produce a scalloped outline on the

intrados of the arch. The dripstones throughout are pointed; but the arch-joints radiate from the centre of the circle. Where the windows are in groups of three they are of broad and low proportion, fitted with French casements, and glazed with large panes of plate-glass. The top ones are better in shape, those beneath them having hardly reveal enough for their breadth. Above the first and second stories are two bands of red terracotta with encircled medallions or circular panels, which are well executed and effective. Most of these are decorated with a kind of fleur de lis, fitting well into the circle; but, by way of variation, heads in low relief are inserted at intervals. Stone string-courses are also freely used. The principal cornice rests on small pointed arches, corbelled out, in Italian-Gothic fashion, on long cantilevers; and the faces of the latter have a leaf ornament almost too small to be well seen from below. On the walls of the third and fourth floors, diaper bricks are employed. In the first case they form a band above the tops of the arches, and are of a simple, overlapping, lozenge pattern; in the second their design is more complex, but still effective. If this sort of ornament were never worse applied than it is here, we should have very little to say against it. Unfortunately, it promises to share the fate of all cheap and easy modes of decoration, and to be abused and vulgarised till it becomes unendurable. Above the eaves cornice appears what might have been the best, and actually is the worst, or, at any rate, the most discordant part of the design. This is a wide dormer, containing three square-headed lights, and crowned by a moulded pediment of ordinary Classic character. So entirely does it differ from the rest of the elevation—in style, in material, and in general treatment—that it is difficult to suppose it to have been the originally intended termination. A good dormer in this situation would have been an admirable finish to the whole; but a more lame and impotent conclusion than the actual one it would be hard to imagine. The roof is of mansard form; there are chimneys conspicuously placed at its sides, but they are quite free from design of any kind.

Looking at the building as a whole, it may be described as a favourable specimen of London street architecture. It is not one of those ill-considered masses which are so plentiful, whose architects, neglecting general form and composition, rely wholly on the carver to make their works presentable. Proportion and arrangement have been studied as far, perhaps, as they usually can be in a tall and narrow street front. An architect whose practice lies in the City has to work under very stringent conditions—he can rarely give the reins to his fancy or put much novelty or originality into his designs. An architect, again, who has to deal with shop fronts is still more closely bound down, and if he escapes a glaring failure should hardly be criticised so severely. From the pavement to the cornice, Mr. P'Anson's present work is generally pleasing, and nowhere conspicuously faulty; we only wish that the dormer and the chimneys had been good enough to form a satisfactory finish to it. As regards decoration, the red terracotta bands are the most noticeable detail. Their surface ornament is sharp and well executed, and plainly distinguishable, in spite of its depth of colour. The foliage of the capitals and corbels, on the contrary, is scarcely bold enough for the height at which they are placed.

NOTES ON CARPENTRY AND ON STRAINS IN STRUCTURES.—VI.

THE choice of the kind of timber to be used in any proposed structure is a matter of some importance. There is strength to be considered, and also durability, and they do not always go together. Then there is the quality of stiffness, which

is distinct from that quality which gives ultimate strength to timber. Thus in a roof the weight to be carried is not great, being not more than 60lb. per square foot, that is 20lb. for the roof and 40lb. for the wind—whereas floors carry more than twice as much, common warehouse floors three times as much, and corn warehouse floors four times as much; but in a roof, subject to the percussive action of the wind, it is necessary that it should be stiff rather than strong, and that timber which (being not more expensive than another) is stiff is better than another which may be stronger, if at the same time it be not so stiff. A roof might be perfectly safe as far as strength is concerned, but if it were subject to vibration the covering would soon be loosened. But in another structure, as, for instance, in a bridge, sheer strength is better than mere stiffness, a property which prevents the material giving any warning of its being overloaded, but when it yields makes it yield suddenly. American red pine has the property of stiffness in a greater degree than Baltic fir, and is therefore very suitable for roofs; while Memel, Riga, or Dantzic timber is more suitable for bridges, joists, and weight-carrying structures, and for outdoor work generally, as being more durable in a variable atmosphere. We shall not discuss the properties of all kinds of timber, some of them but little, if at all, used in carpentry, but shall confine our attention to the three sorts most commonly used—viz., Baltic fir, American pine, and English oak. Of Baltic fir, Mr. Edward Cresy, in his "Encyclopædia of Civil Engineering," says that this (*Pinus sylvestris*) is "of all the species the most valuable for its timber. It is produced in most parts of Europe, and its quality varies with the soil on which it is grown; on a stiff cold earth the wood has a red tinge, and acquires a solidity which it does not attain on sandy or light lands, where it becomes in colour nearly white. Sweden and Norway, as well as Prussia, Poland, and Russia, supply the English market. In Scotland this species of fir, on favourable soils, attains considerable size, and forms most excellent timber. Its durability, especially the red sort, is equal to that of oak. Its weight in a green state is from 54lb. to 74lb. per cubic foot; when dry it weighs from 31lb. to 41lb."

Mr. Joseph Gwilt, in his "Encyclopædia of Architecture," says of Baltic timber, that the annual rings [Here it may be well to remark that most botanists say that a ring of wood grows round the tree each year, that is in exogenous trees, or those which grow outwards, as it were, of which class all timber trees are, as distinguished from the endogenous trees, like the palm; and therefore that one can tell, after the tree has been cut down, how old it is] are, in the best Baltic timber, not more than 1-10th of an inch. The dark parts of the rings are of a bright red colour. That from Norway is the finest sort, to which the best Memel and Riga are much inferior. The inferior timber of this kind, which is not so durable or so capable of bearing strains, has thick annual rings, and abounds with a soft resinous matter, which is clammy, and chokes the saw. Much of the timber of this sort is from Sweden, but it is inferior in strength and stiffness. That which is produced in the colder climates is superior to that which is produced in warmer countries, the Norway timber being much harder than that of Riga. The weight when seasoned is from 29lb. to 40lb. per cubic foot. The same timber (that is, the *Pinus sylvestris*) of English growth weighs from 28lb. to 33lb.

The late Mr. James Newlands, the Borough Engineer of Liverpool, in his "Carpenter's and Joiner's Assistant," says of this timber that it produces "the red or yellow pine, the wild pine, or Scotch fir. The timber grown in Britain, especially in the southern parts, is not so valuable as that grown in the Alpine countries. There are, indeed, excep-

tions, but this appears to be the rule. It is not so sound, it is coarser in the fibre, it contains more sapwood, and is neither so strong nor so durable. Dr. Smith, however, in his essay on the production of timber, says that he has seen some Scotch fir, grown in the North Highlands, which formed the roof of an old castle, and after 300 years it was as fresh and full of resin as newly-imported Memel." Of the timber of the *Pinus sylvestris* "Memel supplies three qualities, viz.—*Crown* in baulk, 13in. × 13in., and from 28 to 50 feet long. Longer timber is apt to be knotty at the small end. *Best Middling*, and *Second Middling*, or *Brack*.—These are of about the same dimensions as *Crown*, but as they contain large knots they are not so fit to be cut into small scantlings. Dantzic common baulks are from 14in. to 16in. square. *Crown* baulks are sometimes so large as 26in. and 30in., and so long as 70ft., but 40ft. is nearer their average length. As this timber is very sound it should be used where whole timbers are required; the *Crown* is especially useful for bearing timbers. Riga baulks are 13in. to 14in. square, and average about 40ft. long. The heart of the baulk is often shaky; it should therefore be divided longitudinally, and the flitches reversed. It is very hard to tell the difference between Memel and Riga timber when in the log."

Professor Rankine, in his "Manual of Civil Engineering," says of this timber, "Pine timber of the best sort is the produce of the red pine, or Scotch fir (*Pinus sylvestris*), grown in Norway, Sweden, Russia, and Poland. The best is exported from Riga, the next from Memel and from Dantzic. The same species of tree grows also in Britain, but is inferior in strength. The annual rings, when this timber is of the best kind, consist of a hard part of a clear dark red colour, and a less hard part of a lighter colour, but still clear and compact. The thickness of the rings should not exceed 1-10th of an inch. The most common size of the logs to be met with in the market is about 13in. square. This is the best of all timber for straight beams, straight ties, and straight pieces in framework generally, and for spars of ships."

The next description of timber we shall notice is the white fir (*Pinus abies*), or Norway spruce, and Mr. Cresy says of it that "it is a variety of white deal, and is the sort which in deals and planks is imported from Christiana. The trees from which these are generally obtained are of 70 or 80 years' growth, and are usually cut into three lengths of about 12ft. each, which are sawn into deals and planks, the most usual thickness of which is 3in., and they are generally 9in. wide." [It may here be remarked, however, that the sizes of converted timber recognised in commerce are as follow:—Planks, 11in. × 3in.; deals, 9in. × 3in.; and battens, 7in. × 2½in.] "In this country they are sold by the hundred, which, in the case of white as well as of yellow deals, contains 120 deals, be their thickness what it may, reduced to a standard thickness of 1½in., a width of 11in., and a length of 12ft. What is called a whole deal is 1½in. thick, and a slit deal is half that thickness. This kind of timber unites better by means of glue than the yellow sort, is much used for interior work in joinery, and is very durable when in a dry state. The colour of spruce fir is a yellow, or rather brown white; the annual ring consists of two parts, one hard and the other softer. The knots are tough, but it is not difficult to work. Besides the importation named, there is a considerable quantity received from America. Christiana fir weighs from 21lb. to 32lb. per cubic foot, when seasoned. That from America about 29lb., and the Norway spruce grown in Britain about 34lb. In seasoning it shrinks about 1-70th, and after being purchased as dry deals at the timber yards about 1-90th."

Of this wood Mr. Newlands says, "This is the produce of the *Pinus abies*, or Norway

spruce. It is light, elastic, but varies in durability with the conditions of soil and climate. It is much less resinous than the Scotch fir, and its colour is a reddish or yellowish white. This tree affords the Burgundy pitch of commerce, and its bark is used for tanning. The timber being fine-grained takes a fine polish, and is easily worked, either with or across the grain. It holds glue remarkably well. The spars are from 30ft. to 60ft. long, and from 6in. to 8in. thick, and are used for scaffold poles, ladders, oars, and masts to small vessels."

Professor Rankine says, "White fir or Deal timber of the best kind is the produce of the spruce fir (*Abies excelsa*) grown in Norway, Sweden, and Russia. The best is that known as Christiana deal. Much of this timber is sawn up for sale in pieces of various thicknesses suited for planking."

ROOD-SCREEN, LLANGWM CHURCH, MONMOUTHSHIRE.

THE rood-screens in our churches were often wrought with an amount of elaboration that is truly astonishing, and they seem to have been made quite a labour of love. Even in out-of-the-way village churches there are still to be found specimens, the cost of which must have been altogether out of proportion to that of the fabric itself. Such examples are, indeed, rare at the present day; but that they were not so formerly is attested by the almost universal remains of provisions made for their support and method of access. Throughout Monmouthshire—and, indeed, generally throughout Wales and its border counties—the staircase that once led to the rood-loft is to be found within the thickness of the wall of the nave, or enclosed within a projection from it, and the doorway from the church is to be found near the chancel, and either within the nave or chancel. In other larger churches only the corbels which supported the main beams of the structure are to be seen, and then it is to be presumed that the staircase of access was a wooden one. We have recently given descriptions of some of the rood-screens which are counted among the richest artistic and archaeological treasures of the county of Norfolk, and more recently of one at Combe Martin, in North Devon, which is a fair example of the class of which many remains exist in that county.

The rood-screen of Llangwm, in Monmouthshire, an engraving of which (from a drawing by Mr. G. Burridge), as proposed to be restored by Mr. Seddon, we give in our present number, may be considered as a typical example of the Welsh class of which we have spoken, and, as such, we shall give a minute description of it.

The church of Llangwm Ucha is situate about three miles from Usk, on the Chepstow-road, and, though now a highway road passes within a quarter of a mile of it, the county used only to be traversed by deeply-sunk lazes, and goods could only be transported on pack horses; a circumstance which, it will be seen, had an influence on the construction and design of the screen-work under notice. Another church, that of Llangwm Issa, recently rebuilt, stands within a few hundred yards of this larger one. Llangwm, however, must have had, at one time, greater relative importance than it now possesses, as it has two prebendal stalls in Llandaff Cathedral. The church consists of a simple nave, 55ft. long internally, by 19ft. wide, with a south porch, and a chancel 31ft. long by 12ft. wide, with a tower projecting nearly midway from it on the north side—an unusual position, but one which has conduced to a beautiful grouping, and the entire structure is a picturesque and charming example of a village church.

There is a staircase turret attached to the tower on its south-western angle, filling up the whole space left between the end of the nave and the chancel and tower. This turret staircase serves both to give access to the rood-loft and to all the stages and roof of the tower.

It somewhat remarkable that the chancel archway, which is entirely concealed from the nave, is unusually fine. The east wall of the nave is no less than 5ft. 6in. thick, and the arch is of four orders, each chamfered, and the inner ones resting on carved corbels.

The screen stretches right across the nave in front of this chancel arch, and consists of eighteen narrow-traceried divisions in two heights; of these the folding doors occupy the four central ones, there being two panels to each door. The next four divisions on each side have the upper panels open, through which the chancel can be seen, and the

three remaining ones on each side being against the responds of the chancel are close boarded, and have been decorated with panels. All the lower panels are filled with rich linen-moulded patterns under delicate traceried heads. A cornice beam is continued through above as a finish to this part of the screen. This is about a foot deep, and has three enrichments between two beads worked in the solid. The coved portion which connected this lower with the upper part of the screen has been destroyed, but there are the sinkings to receive the moulded vertical ribs on the back of the lower beam of the upper portion. The restoration of this coving is, therefore, necessarily entirely conjectural on the part of Mr. Seddon, so far as the horizontal intersecting ribs shown in the drawing are concerned, and also the bosses which cover the intersections and the fringe of carved work carried round each of the square panels.

The next part in order is the noble lower beam of the rood loft, for the whole of which, as shown in the engraving, fortunately there is authority. It is nearly 2ft. deep by 9in. at the top, tapering to about 4in. at the bottom, and has five beads at various distances, and a moulding at the bottom worked in the solid, and all the carved enrichments have been separately wrought and let in between these several beads and mouldings, as well as a strawberry leaf cresting inserted below the moulding and continued round the curve of the side traceried brackets, which are supported by corbels, suggesting in their treatment fan vaulting.

For the upper beam the same authority in the shape of actual remains exists. This is about 1ft. 4in. deep, 9in. wide at top and 4in. at bottom, and has four beads and lower moulding worked in the solid, and has three carved enrichments and carved crestings at top and bottom.

For the treatment of the intermediate space there is less certain authority, as all the panels have vanished, as well as the buttresses or other ornamentation to the front of the standards; with, however, the exception of the small strips of tracery which run up the sides of each standard, and are continued round the soffit of the panels under the beam, between two beads worked in the solid.

For the manner in which this part of the front of the rood loft is restored, Mr. Seddon examined the somewhat similar and more perfect, though less rich screen at Patricio, near Llanthony Abbey. In that example traceried panels of similar description to those shown in the illustration remain, and also the buttresses in front of the standard. Grooves for such panels, and the nails which once attached some such decoration of the standard, are to be found at Llangwm.

There is a rich screen in a church in Merionethshire given in Parker's "Glossary," with panels of tracery varied in design in every instance with a rich and striking effect, but it did not appear that such would be in keeping with the regular treatment of the panel of the lower screen in this case. The flooring of this rood-loft is perfect, and also the whole arrangement of the filling in of the chancel arch at the back of the rood-loft is either perfect or evident. This consisted of a beam 2ft. wide and 1ft. deep, placed level with the floor and top of the tower rood-beam, seen in the illustration, worked with a bold cavetto moulding, and two edge beads on the under side next the chancel, and upright boarding was carried up from the top of the lower screen to this, while above from its outer edge other boarding was continued up to the curve of the second chamfered order of the arch, to a wood moulding fitted to the curve of this, and this beading had four narrow slits with cusped arched heads, to enable the occupants of the loft to look into the chancel.

No remains of any superstructure or sockets for any rood cross or figures can be discerned on the top of the upper beam; but it will be noticed that the central and the side standards of the gallery are wider than the others, and it is an open question whether they may have had figures with canopies on them, but there is nothing to prove this. The central one has, therefore, been filled as it seemed most probable, with perforated tracery. Those at the side are worked triangularly on plan, and set with the back flush with the rest, and fronts facing the nave angle-wise, the lower edge projecting over the enrichments below without any finish, so that it would seem that they may have been concealed by some projecting figure or a corbelled pedestal. This was not ascertained when the accompanying drawing was made, and will entail some alteration from the treatment shown of double buttresses at the angles.

As no doubt the rood-loft would be continually surmounted by the rood-cross and attendant figures, it is supposed these must have been independent, and placed simply upon the beam, or supported from behind the gallery.

There is a platform with three steps in front of the screen, of which only one could be shown in the drawing, and these greatly enhance the dignity of its effect. The screen also is placed upon another step at the chancel, and instead of having one behind it, the illustration differs from the present arrangement in this respect owing to the drawing having been taken from one made before the levels had been reinstated after more careful examination.

It only remains to state that the whole is executed in oak, which has attained a lovely silvery hue from age, but is tolerably sound. Originally, without doubt, the whole was richly illuminated, as traces of colour and gilding are found throughout.

It would appear that behind all the ornaments and traceries, red and green were alternately used, and the ornaments themselves more or less gilt. The panels against the responds showed signs of painting, but of a coarse and rude description, and without figures, so that probably these had been repainted at a late date.

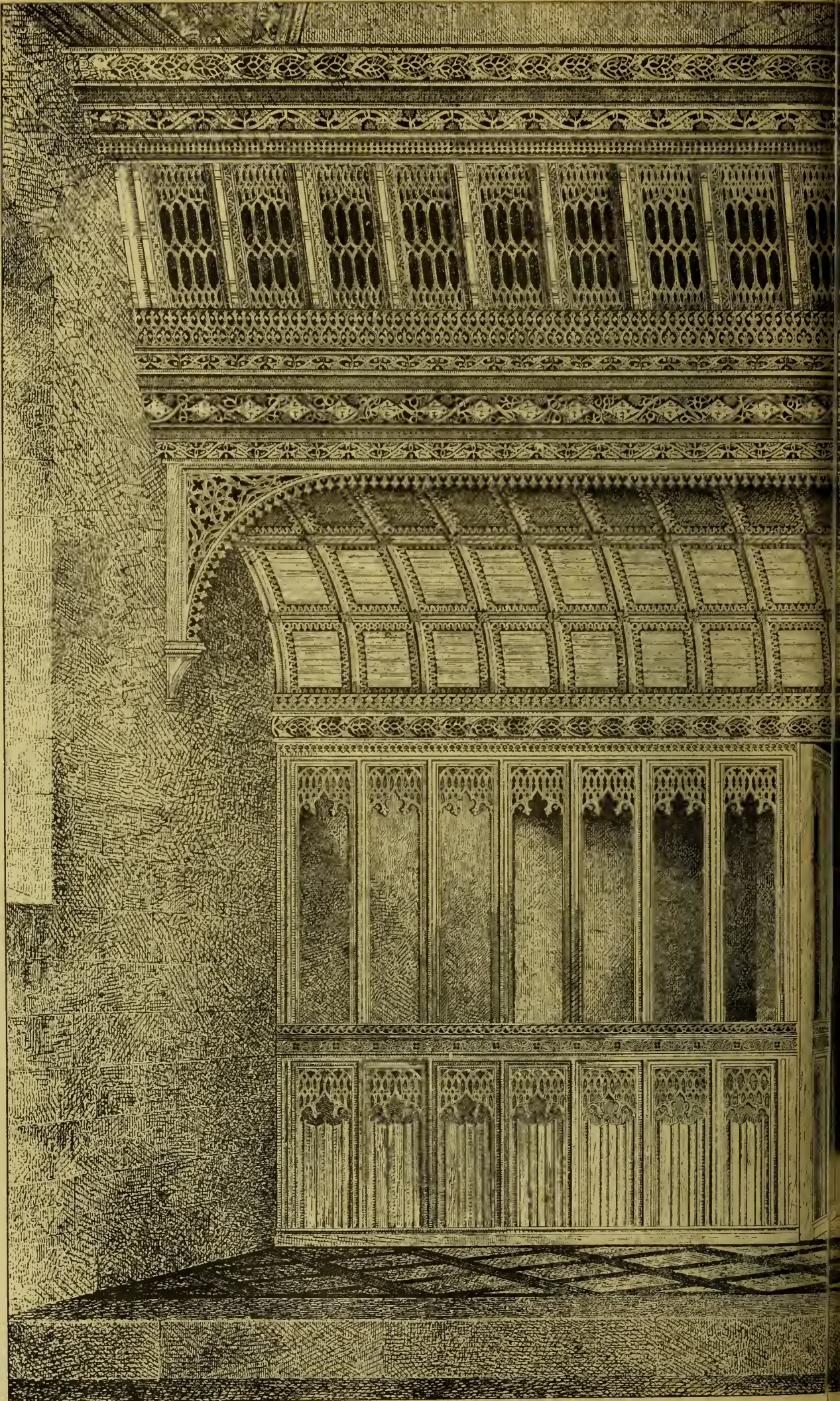
The vicar, the Rev. W. Price, is most anxious to retain the screen exactly in its original position, and to restore it thoroughly; but to do this is quite beyond the means of its rural congregation, and he appeals for aid to the public for that purpose. It is impossible in such a drawing even approximately to represent the exquisite beauty of the carvings; it must suffice, therefore, to say that they are simply unsurpassed in point of refinement and delicacy. This fact, and the method of their insertion between the mouldings wrought in the solid, seems to show that they must have been brought from a distance on horse or mule backs, and the cost of the execution under such circumstances must have been very great.

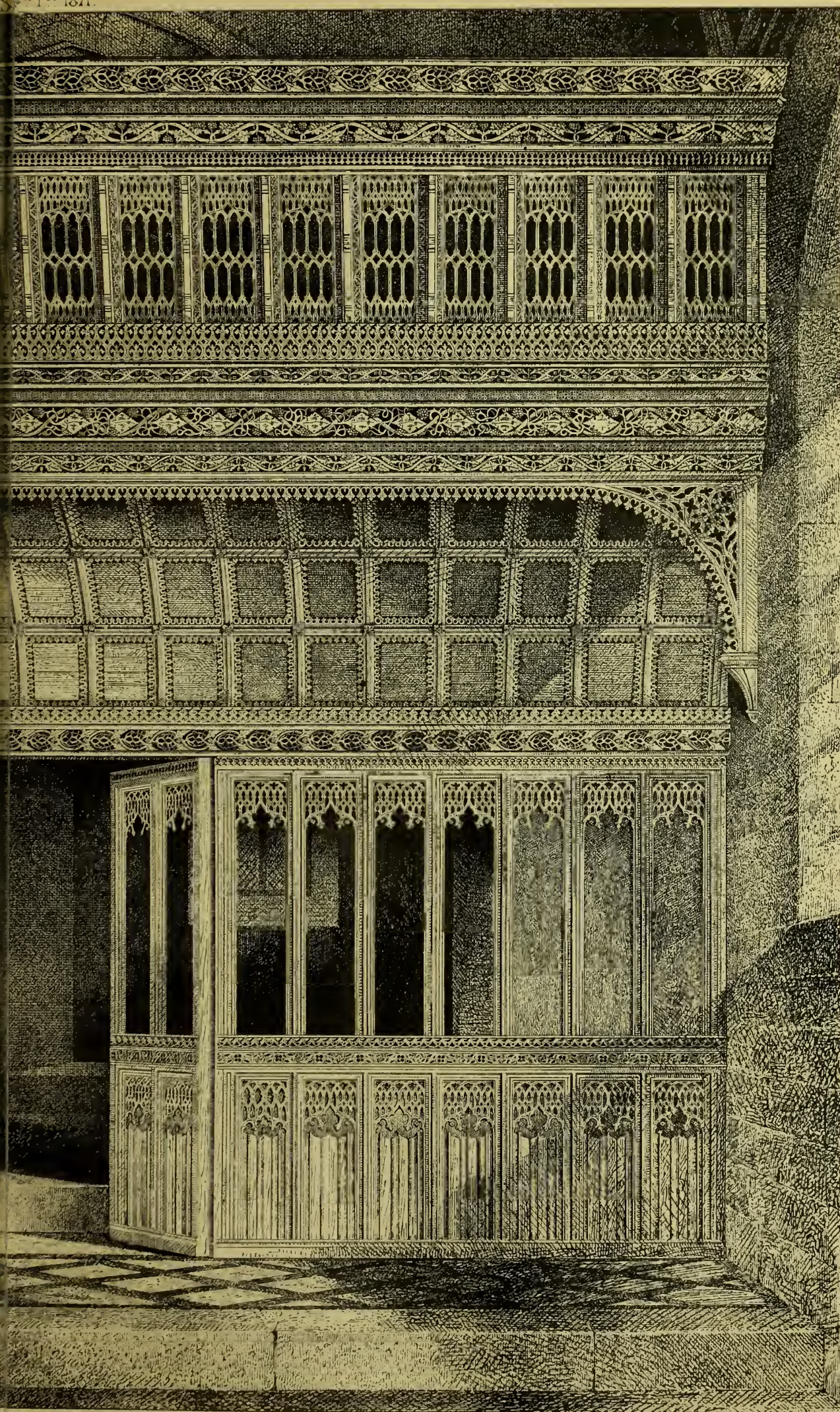
It is not now only that this screen has excited attention, as many years back some ardent admirer of it sought to purchase it of the churchwardens of that day, to whose great credit it is that they remained proof to the temptation. Instructions, it is said, were then sent to a local builder to purloin as much as he could of it that it might be copied, and to this is due much of its present state of dilapidation. Twy House, near Monmouth, the seat of the Duke of Beaufort, possesses many chimney pieces enriched with copies of its carvings cast in lead; and Tortworth Church, in Gloucestershire, is said to have some screenwork copied from this one by the agency above named. The writer, however, has not had the opportunity of learning how far this statement may be correct. Even in its present forlorn and dilapidated condition, this rood-screen of Llangwm Church is worth a pilgrimage to see, and we hope that the laudable design of the vicar to restore it to its pristine magnificence may be carried out.

S. NINIAN'S CAVE, WHITHORN.

THE cave of S. Ninian (says the *Scotsman*) is only a fragment of what it must originally have been. The rocks which had formed its outer side have tumbled down, and the pilgrim must reach the entrance of the present cave over the debris of their ruin, while the surface of the rocks which remain have become disintegrated, so that any carvings that might originally have been on the walls have disappeared. During the recent visit of a party from Monreith, of which the Dean of Westminster and Dr. John Stuart, of Edinburgh, were members, it was observed that on a panel about twenty-five feet to the south-west of the present cave, of which the original surface remained, there was cut the figure of a cross, about nine inches in height, and resembling in character some of the crosses in the caves of Fife. It is not unreasonable, therefore, to suppose that there had originally been other carvings on the walls of the cave, of which the specimen just discovered is only one; and that thus we may imagine the great instructor of the Southern Picts having here made his retreat, like Kentigern, the Apostle of Strathclyde, whom his biographer pictures at the mouth of his cave in the attitude of prayer, and enjoying the indescribable sweetness of his solitude. To the traveller who now visits the sadly-neglected ruins of Whithorn, it is not easy to recall the early importance of the spot, or to enter into the feeling which drew to it pilgrims from every part of the British Islands. The present condition of the ruins betokens that S. Ninian's memory has been greatly forgotten, and it would be a worthy object for those who have the power to rescue them from the degradation and neglect which have overtaken them.

A new clock is being manufactured for All Saints' Church, Knightsbridge, by Messrs. Gillett & Bland, of Croydon. It is to strike the hours and chime the quarters, and the time is to be shown upon four 6ft. dials.





NEW FEVER HOSPITAL AT BRADFORD.

THE group of buildings for the new Bradford Fever Hospital, situate at the top of the hill at Penny Oaks, Leeds-road, are rapidly approaching completion. Of course the primary objects of study with the architects (Messrs. Andrews & Pepper, of Bradford) have been utility and convenience, combined with economy of first cost, and in fulfilling these conditions to the utmost of their ability the architects have striven to make the grouping of their buildings picturesque. The administrative buildings face the north, and behind these are three wards, one story each in height, convalescent wards, and reception ward. These wards, which all stand apart from one another, are united by covered corridors of glass and wood with the administrative department. At the east end, some distance from the other wards, but still united by a corridor, is the scarlatina hospital. Further to the eastward, near the boundary of the estate, is the wash-house, stable, and dead-house. It was originally intended to have had four wards for fever patients, but only three have been built. The wards are lofty, with windows facing the east, south, and west, enabling the sun to shine in at some point whenever that luminary is visible. Ventilation is provided in the roof, at the top of the windows, and under the floor, the air finding its way in the latter direction around the open stoves used for warming, and is thus tempered with heat before entering the ward, preventing chill to the patients in cold weather. The walls are covered with Parian cement—hard, white, and cool as marble, and taking a fine polish, rendering the cleansing down of the the walls an easy operation, the cement looking better the more it is rubbed. The floors are of oak, and as much care has been bestowed on the other accessories as experience could dictate. Each ward is fitted with bath-room and closets, nurse's-room, and spare room, the ventilation being under the control of the nurses in the latter apartment. The wards have a very light, cheerful appearance. The convalescent wards are somewhat elevated, and partake of the cheerful characteristics of the other portions of the hospital. The administrative buildings are being completed in a plain, substantial manner, a series of Gent's electric bells affording ready communication with all parts of the hospital. The land around the building is being laid out, and, from its elevated position, the hospital gets an abundance of air, the strong westerly breezes whistling round the structure; indeed, a constant change of air is insured, from whatever quarter the wind may blow.

BURIED ALIVE.

THE recent lamentable accident at Woolwich, by which a young married woman met a miserable death, deserves the very serious consideration of all who may suspect the existence about their premises of old wells and drains. The inquest on Mrs. Balchin, of 45, King-street, Woolwich, who, by the giving way of the dome of a cesspool, was precipitated some 30ft. into a pit half filled with mud and water, revealed some very uncomfortable facts. Neither the present owner or the occupiers knew of the existence of the pitfall. It appeared that twenty years ago it was a draw-well, and supplied the house with water, but the cutting of the railway adjacent and the construction of the town sewers had drained it dry. Seven years since the then owner of the house, finding the well dangerous as well as useless, employed a local builder to cover it over. This he did by removing 5ft. of the brickwork at the top, and constructing a dome of the old bricks, half a brick in thickness. He did not examine the bottom of the well to see if the foundations were sound, for it had been used to carry off the surface drainage, and contained a quantity of water. The top of the dome was brought up to within 2ft. of the surface, and was calculated to bear any ordinary weight. The bricklayer who did the work having given evidence, a sewer contractor at Plumstead was called, and said that from an examination of the pit he was convinced that it was originally a well about 40ft. deep, with a lining of brick at the upper part to sustain the loose earth. It was usual in sinking a well to dig down to chalk or some other solid foundation, then build the wall on that, and afterwards sink further down inside until water was obtained. Sometimes a lower strata of sand was washed out in the course of years, and the foundations gave way, causing the brick wall to sink like a cylinder to the bottom. This was, no doubt, the case in this instance, and he had satisfied himself by sounding that the dome was now intact at the bottom of the well. It had probably given way some time ago, leaving a mere crust of earth to entrap the first person who should step upon it. The coroner, while admitting that in

the present instance no criminal responsibility could be fixed on any one, observed that nervous people must uncomfortably reflect on the danger of walking in their gardens, and suddenly being engulfed in some unsuspected pitfall, and that it was incumbent on the parish authorities to exercise the utmost vigilance in these matters.

THE BRITISH ARCHEOLOGICAL ASSOCIATION AT WEYMOUTH.

ON Wednesday week Mr. George Eliot read a paper "On the Antiquities of Portland," which was exceedingly well received. This was followed by one from Mr. Drew, F.R.A.S., G.S., "On Art Treasures and their Preservation," which we intend publishing in our next issue. This subject provoked some discussion, in the course of which Mr. Godwin contended that he did not think the cause of decay in the pictures of the present day was to be traced to the desire of the artists to save a few pounds, as he knew they were most anxious for their paintings to stand the test of time; but the reason why the brightness of the tints faded both artists and colourmen were at a loss to tell, and they looked forward with great hopes to the appointment of a professor of chemistry by the Royal Academy. He also differed from Mr. Drew, when he said that the painter's art had not declined, believing that, although some of the paintings of the present day were exceedingly good, he should look in vain for one to match a Raphael or a Vandyke.

Mr. Edwin Levein, M.A., F.S.A., one of the hon. secs., in the absence of Mr. H. S. Cumming, F.S.A. (Scotland), read a very interesting paper on "The Patron Saint of Dorset, S. Edward, King and Martyr," giving a history of the assassination of King Edward at the gate of Corfe Castle.

On Thursday the members of the Congress extended their researches for archeological treasures in the direction of Cerne Abbas and Dorchester. The party left by special train for Dorchester, and afterwards carriages were taken and the party proceeded to Cerne, where a history of the once splendid abbey was given by Mr. E. Roberts, F.S.A. According to William of Malmesbury, this abbey was founded in the time of S. Austin, where his zeal in the conversion of the Saxons to Christianity led him into these parts. The earliest period, however, at which there were any certain accounts of a religious society existing at Cerne is in 870, when Edward, brother of S. Edmund, King of East Anglia, was said to have resided in it. Through veneration for the memory of that monarch, Ailmer, Earl of Cornwall and Devon, rebuilt and endowed the abbey for Benedictine monks about 987. Among the distinguished men who have lived in the abbey was Cardinal Morton. The gatehouse remains externally entire, but does not appear to be of a date long prior to the dissolution. Above the gateway are two stories, each having a projecting window, adorned with elaborate sculpture. Some buildings, now a farmhouse and other dwellings on the south of the gate, evidently at one time belonged to the abbey. A mansion facing Market-street was almost built from the ruins of the abbey. Near the remains of this once venerable edifice runs a remarkable spring of water, in which the saint is said to have baptised his converts. After the party had thoroughly exhausted the abbey, a move was made to the Cerne Giant, an ancient incised figure, cut on the side of a lofty hill. There, with outstretched arm and uplifted club, as though he were the tutelary divinity of the quaint old town, he stands in apparent defiance of the degenerate race below, with which he owes neither kith nor kin. To a person unaccustomed to the sight, this rudely-sculptured figure is an astonishing, and perhaps a repulsive sight. As a few particulars may not prove uninteresting to this monster, we may state his stature to be 180ft., his foot 18ft., his lower limbs 80, body 77, head 22, arms 109, and club 121. The figure covers above an acre of ground. Hutchins states that in 1772 there were three rude letters in the lower limbs, scarcely legible, and over them three others, probably numerals, but they were not satisfactorily deciphered, and are now totally obliterated. The giant is supposed to have been the representation of the Saxon god Heil, who is said to have been worshipped in Dorset, and his idol destroyed by S. Augustine in Cerne, A.D. 603, when he preached Christianity to the pagan Saxons, by whom he was treated with great indignity, which the saint retaliated by working a miracle, which covered them, like the Israelites of old, with perpetual shame. Stukely, in 1764, identified this god Heil with the Phœnician Hercules or Melicartus, who planted, it is said, the first colony on these shores, and he suggested also that it might be the memorial of the ancient British King Eli to commemorate his victory over the Belgæ. There is

a tradition amongst the "natives" that the figure was cut to commemorate the destruction of a giant who, having feasted on some sheep in the valley of Blackmore, laid himself down to sleep after partaking of his meal, when he was bound and killed by the enraged peasants on the spot where the figure is cut.

THE NEW ECCLESIASTICAL DILAPIDATIONS ACT.

THE REV. J. G. JOYCE, rector of Strathfieldsaye, in a letter to the *Guardian*, says:—The New Dilapidations Act engages at this moment the attention of every diocese in England, and must continue to have a permanent interest for all incumbents who have houses of residence upon their benefices. I wish to bring under notice as early as possible an interpretation of certain of its provisions which threatens a difficulty, and calls for a practical solution without delay. A surveyor having been duly elected for the whole diocese of Winchester, the language of the Act was then discussed by those whose duty it was to settle the table of charges, when it appeared that the Act directs the surveyor, if he views for repairs, "to specify in detail" what is needed, to "estimate" probable cost, and calculate what time should be allowed for their completion; upon which he is to survey again, and, if satisfied, then furnish the certificate of protection for five years. Upon the minds of those who on that occasion considered the language of the Act, there was no doubt whatever that as the relief of the clergy was the main issue, the purpose of the Act was that the surveyor under the Act should be the person to direct the repairs, and should draw up after his first survey such a "specification in detail" as a builder could estimate to and work from. It will be apparent, I think, to any man of business that this is not merely just and equitable, but a necessary interpretation, because otherwise, in every instance, the peril would be imminent to an incumbent that the surveyor on his second survey might refuse to pass the repairs. A very trifling difference in the dimensions of timber, or in the quality of other material, might result in the withholding of the certificate of protection after the money was expended. It was, however, alleged on the part of the surveyor, very respectfully and properly, but very definitely, that this was a mistaken view of the Act; that the meaning of the words "specify in detail" merely is, that the surveyor shall signify in his report whether it is the residence, or the offices, the roofs, or walls, or floors which need repair, instead of stating in general terms that repairs are needed; and it was even asserted in reply to the clerical interpretation of the Act, that "the sort of survey made at first would be of very little use for the purpose of drawing up a specification such as a builder could estimate to." A tariff was consequently proposed, *over and above the charges under the Act*, for "the direction of repairs" rateably to their amount, being about 5 per cent. on the outlay. It is of pressing importance to the clergy that in fixing the charges under the Act there should be a most distinct understanding upon the point in question, because, as a matter of finance, it will be quite obvious that the surveyor's view of the Act would leave the clergy to pay, as before, for their repairs 5 per cent. on outlay to the architect, and would impose upon them besides a separate bill of costs under the new Act for two surveys, an estimate, and travelling charges. As the tables of charges are under consideration everywhere at this moment, I am desirous to invite some expression of opinion upon so important a matter, and I would add that it appears to me extremely important, if it were possible, that some common interpretation of the meaning of this Act should be arrived at in all the dioceses before the table of charges is settled in any one. There should be but one law in such transactions.

BOOKS RECEIVED.

Switches and Crossings, &c., &c. By William Donaldson, M.A., A.I.C.E. (London: E. & F.N. Spon.), comprises a series of investigations of considerable interest to railway engineers. The formulæ are based on the assumption that a sufficient degree of approximation to exactness is obtained by making the sine of the angles of the crossing equal to its circular measure.—*Elements of Plane and Solid Geometry.* By W. H. Watson, M.A. (London: Longmans, Green, & Co.), forms the sixth volume of the very valuable and accurate series of Text-Books of Science now being issued by Messrs. Longmans, Green, & Co. The syllogistic form of Euclid is retained throughout; but an extended application of the principle of superposition is employed. The book is fully equal to its predecessors in the series, and that is saying a good deal.—*A Treatise on the*

Building Intelligence.

CHURCHES AND CHAPELS.

CAERSWS.—Christ Church, Caersws, was consecrated yesterday (Thursday) week. The form of the building is that of a parallelogram, of Gothic style, sharp pitch roof, and bell turret, about 50ft. high. The chancel is separated from the nave by steps, and arched frame principal on freestone pillars, 18ft. by 24ft. The vestry is 10ft. by 9ft. The roof is of pitch pine timber, open-framed, and varnished. The internal parts of the walls are plastered stucco, and lined. The seats are of red deal, open framed, stained, and varnished; and will accommodate 200 persons. The choir seats are placed on each side the passage in the chancel, set off by a parapet of carved stone, with pulpit and reading desk divided, one on each side. The walls are built of the well-known gray stone of the Penstrowed quarries; the whole of the windows and door dressings, also the string bands, caps of buttresses, and wreathings of gables and bell turret are of freestone from the Wrexham quarries. The architect was Mr. Edward Jones, of Newtown, and the contractors were Messrs. Edward Williams, of Newtown, and Richard Meredith, of Llanidloes, the contract being for £795.

DUCKLINGTON.—The restoration of Ducklington Church, Witney, is contemplated. Mr. Bruton, architect, of Oxford, estimates that £700 will be required for the purpose. The amount necessary for the renovation of the chancel will be obtained partly by a loan from Queen Anne's Bounty, and partly by private subscriptions.

DUDLEY PORT.—The memorial stones of a Methodist New Connexion chapel were laid on Monday last. The chapel will be 51ft. by 40ft., and including side and end galleries, will seat 500 persons. At the rear will be the schools, 72ft. by 28ft., to accommodate 630 children. The buildings are semi-Gothic in design. The estimate for the chapel, exclusive of the schools, is £2,069. The architect is Mr. Edward Pineher, of West Bromwich; and the builder, Mr. George Haffner, of Tipton.

FLADBURY.—The parish church of Fladbury, Worcestershire, was reopened on the 13th ult., having undergone several important alterations and improvements, under the direction of Mr. F. Preedy. The pews and galleries have been replaced by open seats, free and unappropriated throughout; the Norman tower has been thrown open to the church, an organ-chamber built, and the porch restored. The chancel was thoroughly restored a few years ago.

HALIFAX.—On Monday last the foundation-stone of the New Salem (Methodist New Connexion) Chapel was laid at Halifax. The style of architecture will be Decorated Gothic, the principal façade fronting North-parade. The new chapel has been designed by Messrs. Hill & Swaine, of Leeds, and the works have been let to the following tradesmen: Masons, Messrs. Dixon & Oates; joiners, Messrs. Smith & Brier; plumbers, Messrs. Walsh & Son; plasterer and slater, Mr. Ambler; and painter, Mr. Binns—all of Halifax. The cost is anticipated to be about £4,000.

LLANDRIDDOD WELLS.—Christ Church, Llandriddod Wells, has been opened for divine service. The architect under whose direction the building has been raised, is Mr. T. Nicholson, of Hereford, and the contractor is Mr. Gough, of Bishop's Castle. The style is Early Decorated, and the church is built of the stone of the county, with freestone dressings, and open timber pitch-pine roof left in its natural state, bordered and covered with Narberth green slates. The nave is divided from the north and south aisles by arcades of four arches, carried on pillars with carved capitals. The chancel has chapels on each side for sacristy and organ-chamber, and is separated from the nave by moulded arches, carried on clustered corbels. The nave, aisles, and chancel are covered with tiles, being most decorated in the latter, and the chancel floors rise by gradation from the level of the nave to an ultimate ascent of 3ft. 6in. The inside walls are ashled with freestone. The body of the church is seated with chairs, and the chancel has fixed stalls. The dimensions of the nave are 62ft. in length by 42ft. in breadth, and the chancel measures 32ft. by 20ft. The substructure of the tower is built at the south-west angle of the south aisle, and it is hoped that means will eventually be found to carry up the tower and steeple in conformity with the plan of the architect. The pulpit is of considerable size, and carved in stone, and the front is also a carved specimen of Early Decorated art. The cost has been £2,500.

LONDON.—The *Guardian* states that a scheme has been drawn up for the union of two City livings

Application of Iron to the Construction of Bridges, Girders, Roofs, and other Works. By Francis Campin, C.E. (London: Lockwood & Co.), will prove of considerable service to students and others engaged in the arts of construction. All attempts to familiarise architects and engineers with the use of a frequently-misapplied (because misunderstood) material are to be welcomed.—**Explanatory Mensuration for the Use of Schools.** By the Rev. Alfred Hiley, M.A. (London: Longmans.), although published in a school book, will be found handy by all essaying to obtain a knowledge of mensuration. About 700 questions and answers are given, and the examples embody nearly all the questions set in the Local Examination Papers of the Oxford Delegates.—**The Law and Science of Ancient Lights.** By Homersham Cox, M.A. (London: H. Sweet.), is a second edition of a work previously partly published in a weekly journal, and, according to the preface, "has some pretensions to be regarded as a complete treatise" on the subject.—**Mathematical Instruments; their Construction, Adjustment, Testing, and Use.** By J. F. Heather, M.A. (London: Lockwood & Co.), is an enlarged and re-written edition of this well-known and popular treatise which originally appeared in 1849, and has since been used continuously in Government Naval and Military Schools. The enlargement has necessitated the division of the work in three volumes, of which this is the first, dealing with "Drawing and Measuring Instruments."—**A Rudimentary Treatise on Analytical Geometry and Conic Sections.** By James Haum. New edition, re-written and enlarged by J. R. Young (London: Lockwood & Co.), although bearing the name of the original author, retains little of his work. It aims to lead students already acquainted with the principles of common algebra and plane trigonometry into fields of research fascinating to the intellect, and which may seem to the superficial observer to lie altogether beyond the legitimate province of the science.—**The Workman's Manual of Engineering Drawing.** By John Maxton (London: Lockwood & Co.), is admirably adapted for its purpose—that of enabling the working engineer to instruct himself in an important branch of his business. Seven plates, and nearly 350 illustrations are given.—**A Complete Course of Problems in Practical Plane Geometry.** By W. J. Palliser (Simpkin, Marshall, & Co.), is the result of the author's inability, in his capacity as a science teacher, to obtain a book sufficiently comprehensive and cheap for general use as a text-book for all classes, more particularly for artisans. It is to be followed by a second volume treating on solid geometry, and is very badly printed.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

SOMERSETSHIRE ARCHÆOLOGICAL SOCIETY.—The annual meeting of the Somersetshire Archaeological Society was commenced on Tuesday last at Crewkerne, under the presidency of Mr. E. A. Freeman, D.C.L., and was continued on Wednesday and Thursday (yesterday).

WARWICKSHIRE NATURALISTIC AND ARCHÆOLOGICAL FIELD CLUB.—The last meeting of this club for the season took place on Tuesday, the 22nd ult., when about a dozen members proceeded from Leamington to Kenilworth Castle. After paying the usual fee of 8d. for admission to the Castle, which no archaeologist would begrudge, considering that this source of income is devoted to the repair of the ruins, the members commenced their exploration. In taking a rapid and general glance round the walls, one is immediately struck with the repairs and restorations that have been accomplished. For some time the members were occupied in viewing the recent excavations in the farmyard, where there were heaps of remarkable archaeological remains. Their next study was Lunn's tower, which had "long defied the might of fendal power," but had "sunk decayed with Time more strong." The members then had a hasty walk round the Tilt-yard, the Gatehouse, Caesar's Tower, the Great Hall, the Leicester-buildings, and other well-known parts of the grand, gray, old ruins, for there were many who wanted to discuss the arrangements of the recently uncovered chapel of the Decorated period, in the rick-yard. The richly-sculptured character of the remains, and the singular-shaped apse, would each form a chapter in itself. Mr. Tom Burgess pointed out that if there was any truth in the rumour that Leicester built the gallery tower at the outer end of the tilt-yard, he must have the credit, or the discredit, of demolishing the beautiful chapel, for more than one of the moulded stones from the chapel could be traced in the foundation of the gallery tower, adjoining what he might term the orchard terrace. In the bauqueting hall, Dr. O'Callaghan pointed out the tracery of the windows as being apparently of a later date than that usually applied to structures of the period in which John O'Gaunt lived. Mr. Fritton said he had been struck by the same circumstance, and attributed it to the fact that Leicester's masons had altered the tracery, and inserted the transoms. Mr. Tom Burgess said there was really no reason to doubt the period of the construction. In the fifteenth year of Richard II. (1392) a brief was issued to John Deyncourt, the then constable,

to collect masons, labourers, and material of wood, stone, and tile, for the use of John O'Gaunt, Duke of Lancaster, in his buildings here. It might therefore be stated to be early fifteenth century work, and a good example of Transition work in domestic building. The foundations and remains between the sally port and the wall of the pleasance on the base court were chiefly examined, and the unique tracery on the walls. The party then walked through the picturesque town of Kenilworth, and afterwards proceeded in carriages to Meriden, where the archaeologists were met by Mr. Charles Skidmore, who pointed out the objects of interest in the church, which is dedicated to S. Lawrence. After a glance at the art workshop of Mr. Skidmore, the party proceeded to Kenilworth, where they dined, and afterwards returned to Leamington by train.

ARCHÆOLOGICAL.

NOTES ON THE PRE-HISTORIC ARCHÆOLOGY OF EAST DEVON.—At a meeting of the Devonshire Association on Thursday week, at Bideford, the Rev. R. Kirwan read a paper on this subject. The origin of bronze, said the writer, could be traced to the fact that copper, from its being more easily recognised as a metal, would be employed for cutting instruments before iron, and to the probability that when copper was short tin might have been employed to supply the deficiency. The mixture once made, it would be found that the remitting metal would have qualities different from either of its parents; and experience would soon dictate the proportions that should be employed. In a barrow at Upton Pyne, he had found, in conjunction with Mr. R. M. Lingwood, a bronze pin; a finely-patinated bronze dagger; a small, sepulchral vessel or type known as the incense cup, with two lateral perforations for suspension; a grain of carbonised wheat; fifty beads of shale and a bugle-shaped bead of red clay. It was probable that in those beads they detected the first traces of the use of the turning-lathe in England. He had made an investigation of an ancient camp on Peck-hill, near Sidmouth, where he had found charcoal bones of the pig-deer, sheep, and possibly of the bos longifrons; a quantity of flint flakes and cones; and some implements of bone which were identical in character with those which were discovered in the barrows. Thus he held that the first makers and the barrow builders lived contemporaneously, with or under the same conditions of civilisation. The facts seemed to point out to their being rather a quiet, peaceful people, who erected the forts for the purposes of defence rather than aggression. A very large collection of bones and other things which he had excavated in Peck-hill were laid upon the table, and inspected with considerable interest. In the discussion which followed, Mr. Pengelly stated his belief that the object of a large number of the bones being split was to make the fragments into implements, not to extract the marrow.

URICONIUM.—The following letter has appeared in the *Times*:—"Sir,—You have more than once called attention to the very interesting remains of the ancient city of Uriconim, situated near here. For some years the Shropshire and North Wales Natural History and Antiquarian Society has employed a man to guard the ruins and act as guide to visitors, charging sixpence admission. A letter from Dr. Henry Johnson, the society's secretary, informs me 'the fact is the excavations are now closed so far as we are concerned, as the receipts do not pay for keeping Jones (the care-taker) there.' This is certainly most lamentable, especially when we recollect the dreadful damage done one Good Friday some years ago by some miscreants who threw down the most perfect of the hypocausts. I feel sure that numbers of antiquaries and others throughout the kingdom would gladly aid in subscribing the few shillings per week necessary to keep these most valuable records of the past uninjured. If you would allow the insertion of this letter in the *Times* the end may be gained. I shall be most happy to receive subscriptions, and retain the man at his post.—I am, sir, yours obediently, J. E. Cranage, member of the Council of the Shropshire and North Wales Natural History and Antiquarian Society, The Old Hall, Wellington, Shropshire, August 21st."

TRAMWAYS FOR PARIS.—It is rumoured that a number of companies—English, French, and Belgian—are anxious to establish tramways in Paris. The Prefect of the Seine has accordingly requested the Minister of Public Works to examine a scheme by which the whole of the communes at a distance of six or eight miles round the capital would be placed in communication with it. These lines together would be more than 180 miles in length.

—viz., St. Helen's, Bishopsgate, and St. Martin's, Outwich. The latter church is to be pulled down and the site sold for building purposes, and one if not two new churches are to be built and endowed in some other part of the diocese.

ROCHESTER CATHEDRAL.—The work of restoring the cathedral, under the direction of Mr. Gilbert Scott, is proceeding with good speed. The decayed clerestory windows of the nave are now being restored. The earth has been removed around the east end of the building to ascertain if the foundations are in a proper state, and it has been found that they are quite safe. Scaffolding is being erected at the east end for the restoration of that part of the edifice, which is now in a lamentable state; much of the stonework is broken or decayed, and in many places, at some former time, the stonework was patched in the most hideous manner. In several parts of the cathedral ancient windows were blocked up with stone, and in other cases former "restorations"—if such a word can be used in connection with the work—consisted of making windows, &c., not consistent with the original character of the building. If the cathedral is now to be thoroughly restored by Mr. Scott it will involve a large outlay and a vast amount of work. It is understood that the Dean and Chapter have large funds in hand applicable to this purpose. Mr. White, of Vauxhall-bridge-road, London, is executing the work under Mr. Scott.

S. GEORGE'S CHURCH, HANOVER-SQUARE.—This very fashionable church, built 1724, is undergoing some extensive alterations under the superintendence of Mr. B. Ferrey, F.S.A., and Messrs. R. Fleming and G. Pickett, the present churchwardens. The old-fashioned sittings are reduced to a more modern height, the pulpit and reading desk lowered and made smaller, and all the old obstructions, such as curtains and screens, cleared away, leaving many of the beauties of the church visible, which have, from some mismanagement, in former years been allowed to be covered up. The execution of the whole of the works has been entrusted to Mr. B. B. Sapwell, builder, Mayfair.

S. MARY-CHURCH.—On Tuesday last, the memorial stone of a new tower to the church at St. Mary-Church, near Torquay, was laid by Archdeacon Freeman. The church was rebuilt in the most sumptuous manner some years since, all but the tower. This important feature is now, however, to be added, as a memorial to the late diocesan, Bishop Phillpotts. It will be about 132ft. in height, and has been designed by Mr. Huggall, of Oxford, the architect of the church. The tower will be built in portions, the first to be completed this year, and the second to be proceeded with next year, if sufficient funds, which are as yet sadly deficient, can be provided.

WIMBORNE.—Yesterday (Thursday) week the parish church of Wimborne, Shropshire, was reopened, after entire restoration under the direction of Mr. G. E. Street, R.A. The style of the building is Gothic, plain but substantial, with nave and chancel calculated to accommodate about 160 persons. At the western end there is a spire. In the tower the two old bells are re-hung and the old clock is replaced, but the dial in front of the tower is of new and appropriate design, by Mr. Hannay, of Shrewsbury. The material of the church is red stone, from Suglen Quarry, near Rodington. There are three chancel windows, each filled with stained glass by Clayton and Bell, of London. Underneath is a beautifully-carved reredos, in Caen stone, by Earp, of London, containing seven figures, the subject being "The Crucifixion." The font is very handsome, the base being of carved white stone, the cover of elaborately carved oak. The aisles are floored with coloured quarries, diamond shaped, from Godwin's, of Hereford. The roof is open timbered, and varnished. The communion table was made from the old oak which was found in the former building, and is covered with a richly-embroidered cloth, with the sacred monogram in the front centre. The contract was taken by Mr. Espley, of Eccleshall, for about £1,700.

BUILDINGS.

BIRKENHEAD.—On Saturday last new premises for Mr. Kynaston, butcher, were opened for business. The front of the building is in the Italian style of architecture, and is faced with patent red bricks (from Mr. T. H. Seacombe's brickyard, Ruabon), neatly tuck pointed, and relieved with Stourton stone dressings. The exterior of the shopfront is relieved by carved trusses supporting bulls' heads neatly gilded, which stop the shop's cornice. The architect was Mr. Lewis Hornblower, of Baltic-buildings, Redcross-street, Liverpool, under whose superintendence the whole of the works have been carried out. Mr. Edward Legge, of Grange-lane, Birkenhead, was the contractor.

OLD SWINDON.—New schools in connection with the parish church have been opened at Old Swindon, Wilts. The main building is a handsome structure, and well suited for its purpose. The principal gable, which forms the front on the south side, is 45ft. high, the front extreme measure being 75ft., and the depth 109ft. The boys' school measures 71ft. in length by 20ft. in breadth, in addition to which there are two class-rooms adjoining. The girls' school is 51ft. long by 21ft. wide, and there are also two class-rooms. There are three separate entrances, with suitable approaches. Over one of these is a bell-turret, 50ft. high. The master's house, adjoining the schools, contains sitting-room, kitchen, pantry, washhouse, and other conveniences on the ground floor. The upper floor contains three bedrooms. The architects are Messrs. Lansdowne & Shopland, of Swindon, and the builders Messrs. King & Godwin, of Gloucester. The total cost is a little over £2,000.

SHREWSBURY.—The large room over the old Market Hall, Shrewsbury, has just been altered and adapted so as to serve the purpose of the borough justices' court, the old court having proved very inconvenient. Plans for the necessary alterations were prepared by the Borough Surveyor (Mr. Tisdale). The result has been not only a convenient and commodious court, but one that is in harmony with the quaint architectural features of the building. The court is 40ft. 6in. long, by 23ft. 6in. wide, and the roof 20ft. from the flooring. The old ceiling has been removed, and the roof is open to the original rafters, which are of oak, and have been stained and varnished. The same improvement has also been made in the other old timber of the building. The roof appears to have been originally open, so that the room has been restored, in this respect, to the original design of its builders. The work has been carried out by Mr. Richard Price, builder, of Mountfields, Shrewsbury.

S. LAWRENCE AND NEW FULFORD, YORKS.—The foundation-stone of new schools was laid on Tuesday week. The schools will occupy a position on a plot of ground immediately in the rear of the church of S. Lawrence, and will comprise a boys' school, 45ft. by 20ft.; girls', 50ft. by 20ft.; and infants', 50ft. by 24ft. There will be, in addition, two class rooms, and the building will have three entrance porches. The boys' school will be divided from that of the girls by an arch of stone corbels with granite shafts; and what is known as the Gurney stove will be used for heating purposes. Mr. C. T. Newstead, of Coney-street, York, is the architect, and Mr. Brown, of Monkgate, York, the builder.

THE VICTORIA THEATRE, Waterloo-road, is undergoing alterations, from plans by Mr. J. T. Robinson, Haverstock-hill. The auditorium will be considerably enlarged, by cutting the stage back, and the whole of the present floors and galleries removed and reconstructed. The entrances and staircases will be re-arranged and enlarged, and the stage and appliances replaced. The entrance-front is to be restuccoed, and the flank walls coloured and pointed. The contract has been undertaken by Mr. Thomas Snowden, of Harlow-road, for £5,600.

WILLENHALL.—The memorial-stone of the new stores the Willenhall Co-operative Association was laid on Thursday week. The building, for which is far advanced, is from a design by Mr. Bidlake, architect, of Wolverhampton. Mr. G. Chappelle is the contractor for the work.

TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

RECEIVED.—T. F. R., R. S. J., W. S. H., Q., P. E., J. B.

ORIENTAL.—Your query asking where you can get fire-clay tallies for churchyards is an advertisement.

WALKER & ALBERON.—The drawings of Arncliffe Church returned. Illustrations next week.

C. E. H.—Your note is not authenticated. We should be surprised if it were true that Mr. Gladstone is in favour of a new competition for the New Law Courts in favour of any one.

H. WILKES.—Should be glad of such items of information at any time.

ERRATUM.—In "C. E.'s" letter on "Selenitic Mortar," page 152, last number, in the ninth line of the second paragraph, after "Selenitic," read "mortar."

Correspondence.

GOVERNMENT HONOURS.

To the Editor of the BUILDING NEWS.

SIR,—A statement appeared in your journal last week to the effect that Mr. John Gilbert, R.A., was about to be knighted. Was this meant for what Artemus Ward styles a "goak?" If so, it is a stupid one; it too closely bears upon an unpleasant truth, and truth is no joke. The Royal Academy has not yet honoured itself by conferring membership on John Gilbert, and the knighthood is, I fear, not less hypothetical. The Crown and the Executive Government of this country care not to bestow honours, unless it be, as in the case of Lord Mayors, in exchange for a dinner, or for political purposes, to secure, it may be, a partisan. Genius in art, literature, or science (except as it were by a fluke) receives no favour. John Gilbert is cleverer far than many of the Academicians, and has more merit than most knights, but his talent being recognised in either way is just one of the many things which ought to be, but is not.—I am, &c. P. E. M.

DREDGING THE TIBER.

SIR,—It is interesting to hear that the (by antiquarians) long-desired dredging of the Tiber is about to be begun. A company some years ago made an offer to the Papal Government to make the river navigable if they were allowed to keep as payment whatever objects of value they discovered therein. The offer was declined. Of all possible objects of interest which may be recovered, nothing would surpass in value the seven-branched golden candlestick, brought from the temple at Jerusalem, and which is said to have been thrown into the Tiber at the Pons Milvius, A.D. 312. It is a marvellous circumstance that whilst such ample antiquarian relics remain of other nations, there is positively nothing known to exist illustrating the arts and manufactures of the ancient Jews, not a coin, ornament, weapon, or utensil of any kind.—I am, &c. P. E. M.

POETIC PROPHECIES.

SIR,—The following notes respecting the prophetic power of vision of great poets may, perhaps, present some little interest for your archaeological readers.

1. Homer's vision of a locomotive—"Iliad," b. IV., v. 370.
2. Spenser's vision of the steamboat—"Faerie Queen," b. II., c. 6, stanza 5.
3. Spenser's vision of the electric light—"Faerie Queen," b. II., c. 9, stanza 46.
4. Milton's vision of the steam thrasher—"L'Allegro."—I am, &c. C. E.

CLEANSING WATER-CLOSETS.

SIR,—In the recent minute of Privy Council (dated 10th August, 1871) "On the means of preventing the spread of cholera and other similar diseases," considerable stress is laid on the importance of promptly and efficiently carrying away all noxious matters. The defect of all water-closets is the accumulation of these matters in the pipes, traps, and drain, the quantity of water which passes down the closet being generally insufficient to effect their entire removal. To remedy this defect we have devised a simple and inexpensive plug (a specimen of which we send herewith), by the use of which the lifting of the handle quite fills the basin, and the plug being then removed the whole body of water completely fills, and thoroughly cleanses the traps and pipes, in the quickest and least objectionable manner. If this flushing were done half-a-dozen times in rapid succession in the houses in any neighbourhood, once every day at or about a fixed time, say when the water is flowing into the cistern, the cleansing effect on the sewers in the district would be very considerably greater than if the same quantity of water were dribbled away in the ordinary manner.

As it is very desirable that some such plan should be immediately and generally adopted, we have neither patented nor registered this invention. It can be made by any turner, and patterns can be obtained from us by medical men, sanitary inspectors, and others, on application at our offices, 26, Change-alley, Cornhill, or 133, Upper Thames-street.—We are, &c.,

WM. HARRISON & SON.

[This simple contrivance, which we think is well calculated to effect the object in view, consists of a round disc or plug of wood, about 4in. in diameter, in the centre of the top or upper side of which is fixed a wooden handle, about 15in. long. A continuous flange of indiarubber, half an inch wide, runs round the disc or plug, and the indiarubber, by impinging against the surface of the pan or basin near the bottom, is the means of retaining the water which runs into the pan on lifting the ordinary closet handle. When the pan is full of water, the plug is, of course, to be pulled up by its handle, and the volume of water rushes out of the pan with far greater cleansing effect than can be obtained by the comparatively small quantity of water which passes through the pan in the same amount of time by the present system.—ED. B. N.]

Intercommunication.

QUESTIONS.

[2292].—**Raking Mouldings.**—Can any reader recommend a work from which I can learn the way to get raking mouldings? Also, the way to work what masons call circle upon circle?—H. J. W.

[2293].—**Indian Ink.**—Is there any preparation of Indian ink to be had that will not smear when being coloured over on tracing-paper? And, if so, where can it be had?—H. W.

[2294].—**Duties of Parish Auditors.**—Referring to your article on the above subject, can you inform your readers what would be the awful consequence of an auditor refusing to sign the accounts? I know of a case in which the auditors surcharged a considerable amount as having been improperly expended; but the consequence was that no one took the slightest notice of the matter. The notice of surcharge remains on the books to this day, and has been shown as a somewhat humorous entry.—Q.

[2295].—**House Cistern.**—To exclude poisonous vapours from our cisterns, can any of our correspondents inform me if there exists any objection to a trumpet waste-pipe, of which I append a sketch, showing its state after water has been withdrawn from the cistern?—PLUMBITUNA.

[2296].—**Staining Oak.**—Will some fellow-reader kindly inform me of the best method of staining oak? I am cutting down an old pulpit (150 years old); some of the edges and joints will be scraped and planed. I want to know the best possible method of matching before re-varnishing.—H. J. W.

[2297].—**General Joiner.**—I am thinking of having a general joiner, one that I could shift from job to job, and for manual power. I would feel much obliged if some friend, from his experience, would state whose or what description would be the most suitable.—JOINER.

[2298].—**Surveying Hilly Land.**—In surveying hilly land, is the horizontal or surface measurement taken? Will some one oblige?—T. W. S. (Middlesbrough).

[2299].—**Barn Floor.**—I have heard that a good barn floor can be made out of a composition of mine dust and lime. Can any reader inform me as to the true and proper proportions thereof?—FARMER.

[2300].—**Land Surveying.**—If any one who is acquainted with T. Baker's treatise on the above will kindly tell me whether I am right in supposing that I have found some mistakes in it he will greatly oblige. Take one, for instance—viz.: Example 1, page 22. In the trapezoid D A F f, is not $d f$ the line required for multiplying the sum of perpendiculars by, and not $e f$? Assuming it to be $e f$, would it not equal 280 instead of 395?—PUZZLED.

[2301].—**Wooden Ceilings.**—Would any of our readers kindly inform me of the best and most economical method of constructing wooden ceilings for domestic edifices, and in the Gothic style? Also, the cost, as compared with plaster ceilings?—GOTHIC.

[2302].—**Incompetent Architect.**—Can the proprietor of a building discharge the architect through incompetency without paying him the full percentage on the total cost of the job?—T. M.

[2303].—**Building Materials Used at Leeds.**—What are the prices of bricks (different colours)? Also of stone, and its quality, name, and colour? Also the prices for flooring, slating, and plastering per yard super? What are the prices per yard for walls 9in., 14in., and 18in. thick of brick, and 12in., 18in., and 24in. of stone? What is the building material commonly used at Leeds, and whether brick or stone is found to be the cheaper (labour included)?—W.

REPLIES.

[2284].—**Asphalte for Footpaths.**—"G. P. B." appears to have fallen into the common error that any mixture of gravel and gas tar is an asphalte. This is a complete mistake, and one which has done much harm to the real material. But if he chooses to lay down the above mixture on his footpaths, let him first bring them to an even surface. If the earth is wet or soft, a layer of clean gravel, about 2in. thick, should be first laid down, then the gravel that is next laid on should be mixed with a sufficient quantity of the bituminous substance to cause the stones to stick slightly together. Upon this a finer layer is put, and then some fine clean sand, the operation being terminated by thoroughly rolling the whole surface.—L. S. F.

[2286].—**Portable Photographic Apparatus.**—"W. L. S." will get what he wants at Brodie & Middleton's, artists' colourmen, in Long-acre, near the Drury-lane end.—COLOUR.

[2288].—**Water Impregnated with Lead.**—"F. H." had read carefully the article which appeared in the BUILDING NEWS of August 11th, under

the title of "Iron v. Lead Pipes," he would not have asked the question he has. The reason for the water being affected in the manner it is fully explained.—M. P.

[2288].—**Water Impregnated with Lead.**—Spring water usually acts actively on lead. The old pipe referred to had probably, in course of time, received a hard incrustation, which abated the harm. The agents for the tin-lined pipes are Messrs. Navin & Co., Barge-yard, Bucklersbury, E.C. Having myself several times experienced a difficulty in obtaining the address of the firm, I cannot but express surprise at their not advertising more. They certainly are not consulting their own interests.—M.

[2291].—**Cement.**—Portland cement will set anywhere. If a very quick-setting cement is required, such as is often wanted for the joints of walls exposed to the action of the sea, Medina cement is the best adapted for the purpose.—A. A.

WATER SUPPLY AND SANITARY MATTERS.

SITTINGBOURNE.—The new water-works at Key-coll-hill, Sittingbourne, were formally opened yesterday (Thursday).

THE NEW METROPOLIS WATER ACT.—One of the most important provisions in the new Metropolis Water Act is that for securing a constant supply. At the expiration of eight months from the passing of the Act every company shall, when required to do so, furnish "a constant supply of pure and wholesome water sufficient for the domestic purposes of the inhabitants." The water is to be laid on at such pressure as will cause it to reach the top story of the highest houses.

THE WATER SUPPLY OF COUPAR-ANGUS.—At a public meeting held last week at the Royal Hotel, Coupar-Angus, called by the Chief Commissioner, Mr. Culross, in pursuance of a requisition addressed to him by the local authority for the purpose of ascertaining the opinion of the inhabitants of the burgh as to providing the town with a sufficient supply of pure water, it was resolved:—"That as the only supply of water for the inhabitants of Coupar-Angus which is open to the community is from the Coupar Burn, which is the common sewer of the town, and as the great proportion of the inhabitants make use of this water for domestic purposes, this meeting is of opinion that the use of this water is very injurious to health, being most unwholesome and impure; this meeting agree to request the local authority immediately to put in force the powers conferred on them by Act of Parliament, and take steps without delay to furnish, in as economical a manner as possible, a sufficient supply of pure water for the use of the inhabitants."

THE SEWAGE FARM AT SALTLEY.—According to statistics published in the newspapers, the loss sustained on account of the sewage farm at Saltley amounts to nearly £2,000 a year. The Worcester Chronicle says there is good reason to believe that the statement is correct.

CHOLERA PRECAUTIONS.—"F. R. C. P." writes to the Times as follows:—"While sanitary authorities are being instructed as to the precautions they should take against cholera, there are three simple duties, now more than usually important, that devolve on the master of every house. 1. He should have each and every water cistern properly cleaned out. 2. He should have his dustbin emptied at least twice a week. 3. He should learn by his own senses that there is nowhere any drain in his house."

FORFAR.—THE SANITARY CONDITION OF THE TOWN.—An influentially-attended meeting of the inhabitants of Forfar was held on Wednesday week to consider the best means to be adopted for the abatement of a nuisance at a place at the east end of the Forfar Loch known as the "Bay." Several medical gentlemen present adverted to the nuisance as being injurious to the health of the inhabitants. A resolution appointing a committee to wait on the local authority to urge the necessity for the immediate removal of the nuisance was adopted. The meeting also considered the water supply of the town deficient, and requested the committee to bring under the notice of the Commissioners of Police the subject of a water supply.

SANITARY CONDITION OF ROME.—Rome, it is stated in a letter to the Débats, continues to remain in a very neglected condition. The streets are in a deplorable state, the pavement is very faulty, and the lighting is extremely defective. It is but seldom that the streets are watered, and the sewers have not been flushed since the inundation last December. Notwithstanding that the public health is threatened by this neglect, the municipal authorities allow things to take their course.

The Theatre Lyrique, at Paris, one of the public buildings destroyed by fire during the second siege of Paris, to be restored. As an evidence of the luxury of the Second Empire, it is said that the account for gold leaf for the decoration of this theatre, one of the triumphs of the reign of Haussmann, amounted to not less than £5,000.

STATUES, MEMORIALS, &c.

ATTEMPT TO BLOW DOWN THE KINGSTOWN STATUE OF GEORGE IV.—Shortly after twelve o'clock on Sunday night, when the vast crowds who had been attending the French deputation to Kingstown were nearly dispersed, an attempt was made to blow down the statue of George the Fourth at Kingstown. A tremendous explosion was heard, and on examination it was found that a large quantity of gunpowder had been placed between the four granite balls supporting the pedestal, with the view of destroying the statue. No injury was done beyond the supports being blackened.

THE LANCASHIRE DERBY MEMORIAL.—Mr. Noble the eminent sculptor, and Mr. G. A. Dean, a member of the National Derby Memorial Committee, have been in Preston inspecting the Miller Park, the site agreed upon for the erection of the statue of the late Earl of Derby, now in the hands of Mr. Noble. On viewing the park, Mr. Noble remarked that there was not a finer site in England for the memorial. It is now proposed to place the statue within an alcove or canopy of chaste design, to protect it from the weather and the smoke of the town.

BUST OF SIR WILLIAM TITE FOR THE GUILDHALL, BATH.—Some time ago Mr. Theed executed a bust of Sir William Tite for the London Institution, Finsbury-circus. Subscriptions are now being collected in Bath in order to commission the same sculptor to produce a duplicate bust for the Guildhall in that city.

STAINED GLASS.

THE GUILDHALL, LONDON.—Mr. Deputy McDonnell, a member of the Court of Common Council, has recently intimated his wish to be allowed to place a handsome stained glass window in the Guildhall, and the offer having been accepted, the work will be executed under the direction of the City Lands Committee. Another window, the gift of Mr. Alderman Cotton, will be inserted about the same time.

LICHFIELD CATHEDRAL.—A small two-light window at the extreme west end of the south nave aisle has just been filled with stained glass, the subjects being S. Michael and S. Chad. The work has been executed by Messrs. Burlinton and Grylls, 23, Newman-street, London, and is in memoriam of the late Henry Edward John Howard, Dean of Lichfield.

KIBWORTH.—S. Wilfred's Church, Kibworth, has, during the last two months, had two more stained glass windows put in, now making six in all, five of them being filled with Scripture subjects. One is placed on the north side, and is a three-light window, the subject being the raising of Lazarus. The last window, which has just been filled in, is the small window in the chancel, on the south side. The subject of this window is Christ healing the lepers. In addition to these windows, the patron saint of the Church, S. Wilfred, has just been placed in the niche over the south porch. The figure is in a sitting position, and clothed in clerical robes, with a pastoral staff in his hand, and is the work and gift of Mr. Barfield, carver, &c., of Leicester.

Our Office Table.

SCARLET FEVER IN NEW HOUSES.—The Rev. W. J. Stracey writes to the John Bull, from Buxton Vicarage, near Norwich, "to ask if it is generally known—or to make it known if it is not so—that cases of fever, especially of scarlet fever, are apt to break out in new-built houses about eight or nine months after the same have been completed. This is said to arise from a decomposition which takes place in the hair used in the mortar or plaster of the walls through the action of the lime." Mr. Stracey thinks that if this is found to be a common occurrence, and very nearly at the same period after completion, many families, if they were aware of this fact, might be able to remove for some weeks, so as exactly to avoid this risk. "I have known of this fact," he adds, "for some years past, but am more especially moved to draw attention to it from having lately read in a circular respecting a large boys' school lately opened, that within a short time it became a very pesthouse of scarlet fever. If any of your readers can remember any instances of the kind, I hope they will make them known, or will favour me with concise particulars, which I may make known at some future date."

NEW BRIDGE AT WELSHPOOL.—The foundation-stone of Leighton Bridge, Welshpool, was laid on Thursday week by the Mayor. The preliminary work for the erection of the bridge was commenced some time ago, and the foundation for the buttress on the Welshpool side is now firmly laid, and the foundations for the second and third buttresses are being rapidly proceeded with. The corner stones of this buttress are of great weight and size. The principal stone measures 11ft. by 5ft. 9in., and is

7ft. 6in. on the concrete. The second corner stone contains 48 superficial feet and is 10in. in thickness. The stones are of Yorkshire rag landings. The bridge will be a substantial, handsome looking structure, and is to be built principally of Pool Rock stone, with dressed blocking-course and wall stone. The height will be 14ft. above the bed of the river in the old ford to the underside girder. The parapets will be constructed of perforated cast sheets with three 8in. cast iron pilasters to each opening. It will be finished with wing walls and coping, and have a roadway 20ft. wide with 6ft. abutment pillars, and 5ft. pilasters with heavy castings. There will be five girders to the span. The total expense of the work will be £1,600. Messrs. Fisher & Dyson, of Huddersfield, are the contractors, and the work will be superintended by Mr. Carver, the architect and engineer on the Leighton estate.

NEW PUBLIC PARKS.—Ashtou-under-Lyne is to have a people's park. The late Samuel Oldham, several years ago, bequeathed £7,000 as the nucleus of a fund for obtaining such a park, and now a gentleman who lately purchased Highfield House and its park-like grounds, the original cost of which was £15,000, has presented it to the public for the trifling consideration of £2,000. The park is nine acres in extent, and is subject to a yearly chief rent of £131 to the Earl of Stamford and Warrington, which his lordship has agreed to cancel. By other inexpensive additions, the size of the park is to be increased to fifty acres.—The *Leeds Mercury* states that a few days ago the Purchase of Property Committee of the Leeds Corporation inspected some land on the south side of Roundhay-road, with a view to acquiring the property for a public park for the town.

THE SOCIAL SCIENCE CONGRESS AT LEEDS.—The annual Social Science Congress will commence on the 4th of October next, Leeds being this year the place of meeting. Among the questions which will be treated of in papers and discussed by the members are several of the highest importance, considered in relation to the public health. In the Health Section (which will be presided over by Mr. George Godwin, F.R.S.) the following, among other topics, will engage attention:—1st. What are the best and most economical methods of removing and utilising the sewage of large towns? 2. What are the best means of securing the sanitary improvement of human habitations? 3. What are the best means of promoting the health of operatives in factories and workshops? In the Economy and Trade Section (to be presided over by Mr. William Newmarch, F.R.S.) the following questions, among others, will be taken into consideration:—1. What principles ought to regulate the assessment and administration of local taxation? 2. Is it desirable that the State or municipality should assist in providing improved dwellings for the lower classes? and, if so, to what extent, and in what way?

TRAMWAYS IN BIRMINGHAM.—We observe that the Birmingham Town Council are about to lay down a system of street tramways and (we presume) to appropriate the profits accruing from the traffic to the reduction of the local taxation—a course which the Metropolitan Board of Works has declined to pursue with regard to London. A special meeting of the Birmingham Town Council has been held to consider the question. After a long debate it was resolved that the Council, as the local authority, should make application for a provisional order, authorising the construction of Tramways within the borough; and the Public Works Committee was authorised to take the necessary steps to obtain the provisional order, and to empower the Council to levy tolls for the use of the tramways.

NEW CLOCK TOWER FOR THE TEMPLE.—Passers through and frequenters of the Temple have for some time past missed the great clock which used to look on the terrace and gardens of the Inner Temple from the point of junction between the hall and library. When the old hall was pulled down the clock disappeared, and in rearing the new hall, no provision was made for replacing it. Now, however, there is in course of erection what will be a very handsome clock tower and additional entrance to the library, the place of erection being the extreme eastern end of the range of structures comprising the hall and library.

THE FORTHCOMING LIVERPOOL ART EXHIBITION.—This exhibition, which will open on Monday next, the 4th inst., will comprise about 900 productions of leading artists of the day, many of them brought from the Old and New Water-Colour Society, the Dudley Gallery, and the Suffolk-street Gallery—all London institutions—and will continue open to the end of October. There will also be some very fine statuary.

THE NEW LOCAL GOVERNMENT BOARD.—The Right Hon. James Stansfeld is gazetted President of the new Local Government Board, and by the new Act the board is deemed to be established as soon as the President is appointed. The powers to be exercised by the new board relate to the registration of births, deaths, and marriages, public health, local government, drainage, &c., baths and wash-houses, public improvements, &c., and to the prevention of disease, and to vaccination, the last two having been under the Privy Council, and the former under the Home Secretary.

VICTORIA-STREET.—Through the instrumentality of Mr. Lucette, the greater portion, if not the whole, of Victoria-street will shortly be completed. The buildings now to be erected will be placed on the sites westward of the Westminster Chambers, and will be carried on simultaneously on both sides of the road. They are especially arranged for the convenience of members of Parliament, and will be built in flats, somewhat similar to the Belgrave Mansions, but without shops beneath. The estimated cost, when completed, will be about £270,000. The design of the buildings is by Mr. Welby Pugin, of Westminster.

LEAMINGTON SCHOOL OF ART.—This flourishing and well-conducted school, which is in connection with the Philosophical Society, will reopen on Tuesday next, the 5th inst.

WORKMEN'S DWELLINGS FOR LONDON.—It is stated that a new scheme for providing working men with commodious and healthy dwellings will shortly be started in the Metropolis. Its promoters, who include several influential members of Parliament, dissent from the policy pursued by the Trustees of the Peabody Fund, in building large barracks. Their plan is, in fact, an extension of that so successfully tried by Mr. Ruskin and Miss Octavia Hill. There is plenty of scope in London for enterprises of this description, while experience has shown that under proper management they may be made to yield a good profit. As we have repeatedly pointed out, the great destruction of house property occasioned by recent street improvements and railway extensions renders this matter a pressing one.

CATHEDRAL RESTORATION AND REFORM.—The choir of Gloucester Cathedral was reopened on Sunday week after having been closed for three years, and after having, in the interim, been beautified at a cost which in the end will be at least £13,000 of the £45,000, which is Mr. Scott's original estimate for the complete restoration of the cathedral. The preacher in the morning was the Bishop of the diocese. In the course of his sermon, Dr. Eliott said:—"Let every cathedral more and more strive to free itself from its half inherited, half adopted, collegiate system, from its closes and seclusions, and make itself not only the mother church of the city, but the parish church of the diocese, and then let it fearlessly face any trial which the stirring times in which we live may think fit to apply to it."

Chips.

Broadwoodwidge Church, Devonshire, was reopened on the 11th ult. by the Bishop of Exeter.

The works for the new station at Bristol, to be constructed by the Great Western, Midland, and Bristol and Exeter Railway Companies, have been commenced.

The autumnal exhibition of the Royal Birmingham Society of Artists opened on Saturday last, which was the "private view" day.

The *Union* states that the magnificent Abbey of La Trappe, near Mortagne (Orne) has just been partly destroyed by fire.

The Baroness Burdett-Connis has given £50 to the fund for preserving Epping Forest.

On applications for contributions to improvements the Metropolitan Board of Works have, during the year, voted the sum of £67,171 13s. 8d.

Of the building plots in Queen Victoria-street, City, fifteen have been let by the Metropolitan Board of Works on leases of 80 years, giving a total annual rental of £10,936.

S. May's Episcopal Chapel, Reading, will be reopened on Sunday next, after repairs and alterations.

The foundation-stone of schools for S. Matthew's, Yiewsley, in the parish of Hillingdon, was laid on the 17th ult., by Bishop Cloughton, Archdeacon of London. The schools, for 300 boys, girls, and infants, are to be built from designs by Mr. W. White, F.S.A., architect, of Wimpole-street.

A new Wesleyan Chapel is about to be erected in the village of Yearsley, from a design by Mr. E. Taylor, architect, of York. The foundation-stone was laid on Tuesday week.

The Church of S. Dunstan-in-the-East, Great Tower-street, having been closed for repairs, was re-opened on Sunday last.

A notice has been given that the Oxford Town Council intends memorialising the Lords Commissioners of Her Majesty's Treasury for their approbation to sell, alienate, and convey a piece of land, extending from New Inn-hall-street to George-street, the property of the Mayor, Aldermen, and citizens, to the Local Board of Oxford, for the purpose of forming a new street. The consideration to be paid for the land is £1,000.

The Home Secretary has refused to give his sanction to the adoption of the Local Government Act in Brackley.

The parish church of Ebberston, near Pickering, Yorkshire, has been re-opened. The chancel has been rebuilt at the cost of the Ecclesiastical Commissioners.

New swimming and medical baths (which have been erected at a cost of £22,000) were opened at Harrogate on Saturday last.

S. Botolph's Church, Colchester, was reopened on Sunday last, after a "thorough cleansing and re-decorating."

Land of the value of £1,789,913 has been sold in the Landed Estates Court of Ireland between the 1st of January, 1870, and the 10th of July, 1871.

New almshouses at Huddersfield, erected by Mr. Joseph Hurst, were reopened on Saturday last.

On Monday last the first pile of the new pier at Redcar was driven by Rear-Admiral Chaloner. The pier is to be completed by June 1st, 1872.

On Saturday last the corner-stone of a large school in connection with Christ Church, Tintwistle, was laid by Mr. J. Sidebottom. The cost will be between £4,000 and £5,000, and the school will accommodate 600 scholars.

Iron-clad churches are becoming quite a feature in New York architecture. Four of these edifices are now in course of erection, the most insignificant of which is to cost 31,000 dols., and the most sumptuous 61,000 dols.

The foundation-stone of a new Congregational Church will be laid at Oswestry on Thursday next, the 7th inst.

The Gateshead School Board last week received authority to erect schools for 4,000 scholars.

PERSONAL.

Sir Titus Salt was on Saturday last presented with an address and his portrait, in recognition of his late gift of a public park for Saltaire.

Dr. Thomas Nicholas has in the press a volume on "The Annals and Antiquities of the Counties and Families of Wales," with illustrations of the castles, &c.

M. Fourueyron, the French engineer, whose name is well known in connection with the turbine water wheel, has bequeathed to the Academy of Science of Paris a sum of money which will produce from £40 to £50, to be given every two years for the best memoir on applied mechanics.

Mrs. John Wood has, it is said, decided to build a new theatre in London, to be called the "National," and to be devoted to old English comedies and dramas.

Mr. J. Squire, of Ross, Herefordshire, has been awarded the second silver medal of the Royal Cornwall Polytechnic Society, for his water-colour drawing, "Evening at the Bedruthan Steps, Cornwall."

Sir Laurence Palk, M.P., was last week entertained at a banquet at Torquay, and was presented with his portrait, in recognition of his enterprising spirit in constructing a new harbour at Torquay, at a cost of £90,000.

Lord Wrottesley has consented to open the new townhall at Wolverhampton in October next.

Timber Trade Review.

Prices, 28th August, per Petersburg standard.—Fine and handsome Swedish, £7 5s. to £8 5s., Archangel best yellow, £12 10s. to £14 10s.; ditto second yellow, £9 10s. to £10 5s.; Petersburg best yellow, £13 5s. to £13 10s.; Quebec first bright yellow pine, £18 to £19 15s.; ditto second quality floated, £16 10s. to £18 5s.; ditto second quality bright, £13 5s. to £13 15s.; ditto second quality floated, £12 10s. to £13 5s.; ditto third quality bright, £8 5s. to £9 10s.; ditto third quality floated, £8 10s. to £9; St. John's mixed pine, £7 5s. to £8 5s.; Quebec first white spruce, £9 10s. to £11; ditto second quality, £8 10s. to £9; ditto third quality, £8 to £8 5s.; St. John's first white spruce, £8 10s. to £9 5s.; ditto second quality, £8 to £8 5s.; ditto third quality, £7 10s. to £7 15s.; ditto unsorted, £8 to £8 5s.; Prince Edward's Island white spruce, £7 5s. to £7 15s.; spruce batten, £7 to £7 15s.; pitch pine planks, £12 10s. to £13 5s.; Gelfe and best Swedish deals, £10 10s. to £12 10s.

Timber per load: Pitch pine, £3 10s. to £3 15s.; Quebec oak, £6 to £6 5s.; Memel crown fir, £4 to £4 10s.; ditto best middling £3 5s. to £3 15s.; ditto common middling, £2 10s. to £2 15s.; Smidswall, £2 5s. to £2 15s.

Trade News.

WAGES MOVEMENT.

THE NEWCASTLE SLATERS.—The hundred slaters who came out on strike a fortnight ago in Newcastle have got an advance of 2s. per week. They resumed work on Monday last.

THE STRIKE OF MASONS AT BERLIN.—The masons' strike at Berlin, which has lasted for some weeks, is now at an end. The conditions are not stated, but the telegram leaves the impression that the men have been beaten. It is estimated that this strike has cost the workmen about 200,000 thalers wages.

TENDERS.

BARNES.—For alterations and additions to stables, &c., Red Lion Hotel. Messrs. D. Haylock & Son, architects, Clapham Junction:—

Mansell	£265 0
Cooper	220 0
Picking	196 10
Hearn (accepted)	194 10

BATTERSEA.—For the erection of a new manufactory for the Patent Plumbago Crucible Company, Battersea. Quantities by Mr. W. B. Backshole:—

Sharplington & Cole	£3111
Burge & Ramage	2885
Jackson & Shaw	2824
Bracher & Son	2690
Manley & Rogers	2657

BIRMINGHAM.—For the erection of St. Paul's Vicarage. Quantities supplied by the architect, Mr. William Davis:—

Sweet	£1583 17
Sapcote & Son	1540 0
Bloore	1530 0
Parton	1477 0
Wilson & Son (accepted)	1465 0
Barker & Son	1425 0

BIRMINGHAM.—For factory at Small Heath, for Mr. T. Shakespear. Quantities supplied by the architect, Mr. William Davis:—

Partridge	£1890 0
Matthews	1658 0
Harborne	1628 16
Smith, W. & B. N.	1621 0
Parton	1599 0
Sapcote & Son (accepted)	1596 0
Mounford	1495 0

BIRMINGHAM.—For residence at Bird's-hill, for Henry Horsell, Esq. Quantities supplied by the architect, Mr. William Davis:—

Harborne	£1061 7 4
Partridge	1050 0 0
Jeffrey & Pritchard	1040 0 0
Twigg & Fowke	1039 0 0
Bloore	1026 10 0
Parton (accepted)	1024 19 0

BRENTFORD.—For the erection of a school, &c., in connection with the Congregational Chapel, Boston-road, Brentford. Mr. John W. Smithies, architect:—

Gibson Brothers	£435
Wiles	411
Brinsden	347
Bostel (accepted)	318

BUCKS.—For new national schools, teachers' residences, &c., at Missenden and Lee, Bucks. Quantities supplied. Mr. Arthur Vernon, architect:—

Clarke & Hobbs	£1680
Reavell	1600
Hunt	1600
Wooliams	1551
Corby	1545
Honour & Castle	1487
Holland	1480
Dover, Dowel, & Co.	1476
Snell	1453
Spicer	1430
Clarke & Holland	1375
Smith & Fincher	1305
Fincher	1302
Almond	1299
Johnson	1285
Taylor	1250

MAIDSTONE.—For the erection of a new wing to Chillington House, for the Charles Museum:—

Ansecomb	£2034
Davis	1905
Holloway & Elmore	1899
Vaughan	1895
Church	1844
Cox Brothers	1789
Clements & Wallis	1789
Bridge	1725
Avard (accepted)	1674
Abnett	1667

READING.—For corn store, Abbey, Reading, for Mr. R. Oakshot. Messrs. Wm. & J. F. Brown, architects:—

Wheeler Bros.	£498 0 0
Barnicoat	449 0 0
Dunn	439 7 6
Matthews (accepted)	427 0 0

STAFFORD.—For smallpox and fever hospital for eight persons, in connection with the union workhouse for the Stafford Board of Guardians:—

Ratcliffe (accepted)	£325
(Fencing)	£13 10s. extra

THURNHAM, KENT.—For the erection of school and class-room, and teacher's residence, at Thurnham, Kent. Mr. Martin Bulmer, architect:—

Dover, Dowel, Willis & Co.	£1270
Wallis & Clements	1150
Marley	1130
Avard	1111
Bridge	1083
Cox Brothers	1075
Abnett (accepted)	1060

WHARFEDALE.—For a new union workhouse at Wharfedale:—

Boothman & Broomhead (accepted)	£10,000
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Sixty tenders were received.)

YEOVIL.—For erecting a villa residence at Hendford Yeoil, for Mr. C. Sharp:—

Chant	£875
Bartlett & Sons	860
Cox	860

CONTRACTS OPEN FOR BUILDING ESTIMATES.

MANSFIELD CO-OPERATIVE INDUSTRIAL SOCIETY, LIMITED, September 5.—For the erection of a corn-mill.—R. Ginthorpe, Secretary.

STOCKPORT UNION, September 28.—For the supply of nine iron bedsteads, and four invalid bedsteads, with rackheads.—F. W. Johnson, Clerk to the Union, Union Offices, Stockport.

LANCASHIRE AND YORKSHIRE RAILWAY, September 5.—For improved waiting-room accommodation at Wigau Station.—Win. S. Lawn, Secretary, Hunt's Bank, Manchester.

KILKENNY, October 2.—For the removal of the present St. John's-bridge, over the River Nore, and erecting a new bridge, consisting of three cast-iron arches, about 40ft. span each, on stone piers and abutments.—Peter Burtchell, Esq., County Surveyor, County Surveyor's Offices, Court House, Kilkenny.

LEEDS, September 4.—For the erection of houses in Lee's-yard, Meadow-lane.—George Corson, architect, 5, South Parade, Leeds.

DARLINGTON, September 4.—For the construction of a new service reservoir, near Harrowgate Hill Toll-gate.—Hugh Dunn, Town Clerk, Darlington.

WAR DEPARTMENT CONTRACT, September 9.—For the erection of married soldiers' quarters for the South Cavalry Barrack, Aldershot.—Royal Engineer Office, Aldershot.

MIDLAND RAILWAY, September 4.—For the erection of a warehouse at S. Pancras Goods Station.—J. Williams, Secretary, Derby.

MIDLAND RAILWAY, September 4.—For the erection of a warehouse at S. Mary's Goods Station, Derby.—J. Williams, Secretary, Derby.

MIDLAND RAILWAY, September 4.—For the erection of an engine shed at Wigston.—J. Williams, Secretary, Derby.

READING LOCAL BOARD OF HEALTH, September 6.—For the construction of about 5,200 yards of egg-shaped brick sewers, varying from 6ft. in diameter to 2ft. 6in. by 1ft. 8in., about 35,000 yards stoneware pipe, and upwards of 2,000 yards of cast iron pipe sewers, principally 24 inch diameter.—T. Rogers, Clerk to the Board, Reading.

WESTMINSTER UNION, September 15.—For the erection of infirmaries offices and new wing to the Union School, Wandsworth-common.—W. B. West, Clerk, Board-room, Marshall-street, Golden-square.

WHITECHAPEL CHARITY ESTATES, September 12.—For rebuilding Nos. 22 to 27, Princes-street, and others in Bell-court, at the rear.—H. S. Mitchell, Vestry Clerk's Offices, 5, Great Prescott-street, White-chapel.

WEST HAM LOCAL BOARD OF HEALTH, September 16.—For the hire of horses and carts, and the supply of the following materials:—1,500 yards cube Kentish flints, 1,500 yards cube Bombay granite, 1,500 yards cube Port Philip granite, and 1,500 yards cube broken Guernsey granite.—C. Wilson, Clerk, Town Hall, Stratford, E.

NORTH EASTERN RAILWAY, September 5.—For the erection of six cottages at Guisborough, two cottages at Skinningrove, and additions to the goods warehouse and offices at Bishop Auckland.—J. E. Mac Nay, secretary, Railway Offices, Darlington.

LEICESTER.—For the erection of the proposed New Fever Hospital.—S. Stone, Town Clerk, Leicester.

BATH AND OTHER BUILDING STONES, OF BEST QUALITY.

RANDELL, SAUNDERS & CO., Limited,
Quarymen and Stone Merchants.

List of prices at the Quarries and Depôts, also cost of transit to any part of the United Kingdom, furnished on application to

BATH STONE OFFICE:
[ADVT.] CORSHAM, WILTS.

TO ARCHITECTS.

GREEN ROOFING-SLATES.

As supplied to H.R.H. The Prince of Wales at Sandringham The Penmoyle Sea-green Slates are specially adapted for Churches, Public Buildings, &c., &c.

(Less costly than ordinary Gothic Tiling.)

These durable and non-absorbent Slates can be obtained in sizes suitable for Gothic Architecture, at prices as under.

In Railway Trucks, Docks, Gloucester:—

Best Green Slates 14 by 7 ...	Per Equivalent to 1,200 Slates, per square
Do. do. 13 by 8 ...	2 17 6 ... 16s. 6d.
Do. do. 13 by 7 ...	2 17 6 ... 16s. 6d.
Do. do. 12 by 7 ...	2 5 0 ... 14s.
Do. do. 12 by 6 ...	1 13 6 ... 13s.
Do. do. 12 by 6 ...	1 7 6 ... 11s.

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MESSRS. RANDELL & CO., Corsham, Wilts.
Specimens at Museum of Geology, Jermyn-street, Piccadilly, W., and at Architectural Museum, Tufton-street, Westminster.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

LEAD.			
Pig—Foreign	per ton	£17 10 0	£17 12 6
" English W.B.	do	20 5 0	20 10 0
" Lead Co.	do	18 10 0	18 16 0
" Other brands	do	18 0 0	18 5 0
Sheet Milled	do	18 5 0	0 0 0
Shot, Patent	do	20 10 0	0 0 0
Red or minium	do	20 10 0	0 0 0
Litharge, W.B.	do	0 0 0	0 0 0
White Dry.	do	25 10 0	23 0 0
" ground in oil	do	0 0 0	0 0 0

COPPER.			
British—Cake & Ingot	per ton	74 0 0	76 0 0
Best Selected	do	76 0 0	78 0 0
Sheet	do	75 0 0	81 0 0
Bottoms	do	81 0 0	83 0 0
Australian	do	75 0 0	73 0 0
Spanish Cake	do	68 0 0	70 0 0
Chili Bars, cash	do	66 10 0	68 10 0
" Refined ingot	do	76 0 0	0 0 0
Yellow Metal	per lb.	0 0 6½	0 0 7½

IRON.			
Pig in Scotland, cash	per ton	3 2 6	0 0 0
Welsh Bar, in London	do	7 10 0	7 12 6
" Wales	do	6 15 0	6 17 6
Staffordshire	do	8 5 0	8 15 0
Rail, in Wales	do	6 15 0	7 0 0
Sheets, single in London	do	9 15 0	10 15 0
Hoops, first quality	do	9 0 0	9 15 0
Nail Rod	do	8 5 0	8 10 0
Swedish	do	9 15 0	10 0 0

OILS, &c.			
Seal, pale	per tun	33 0 0	0 0 0
Sperui body	do	80 0 0	81 0 0
Cod	do	21 13 0	0 0 0
Whale, South Sea, pale	do	33 0 0	33 10 0
Olive, Gallipoli	do	51 0 0	52 0 0
Cocunut, Cochín, tun	do	51 0 0	0 0 0
Palm, fine	do	37 0 0	0 0 0
Linseed	do	33 0 0	0 0 6
Rapeseed, Eng. pale	do	44 0 0	0 0 0
Cottonseed	do	29 10 0	35 10 0

BANKRUPTS.

TO SURRENDER IN LONDON.

Hosegood, Thomas William, and Turner, Joseph George yard, Whitechapel, colour and varnish manufacturers, September 15, at 11.

TO SURRENDER IN THE COUNTRY.

Gadsby, John, Derby, builder, September 9, at Derby.

PUBLIC EXAMINATIONS.

November 7, J. Kain, Walthamstow, builder.—September 29, J. Rushforth, Huddersfield, architect.

DECLARATION OF DIVIDEND.

J. Story, Southtown, Suffolk, carpenter, div. 2s. 6d. on and after September 4.

DIVIDEND MEETING.

September 23, G. V. Barlow, Easton-on-the-Hill, Northamptonshire, stonemason.

SCOTCH SEQUESTRATION.

John Longmuir, Kilwinning, contractor, September 4, at 12.

PARTNERSHIPS DISSOLVED.

Close, Ayre, and Nicholson, York, ironfounders—Carter, Wootton, and Chippendale, Preston, plumbers—H. and R. Searns, Brixton, builders—Cavill and Co., Sheffield, engineers—Matthews and Staple, Birmingham, stonemasons—Dronfield and Bolton, Oldham, brick-makers—Pant, Coal, Brick, and Fire-Clay Company, Ruabon—Hodge, Hisslop, Dunlop, and Co., Liverpool, engineers—Helliwell, Hinchcliff, and Co., Milnsbridge, Yorkshire, ironfounders—Wilder and Sons, Reading, ironfounders.

ALEXANDRA PALACE & MUSWELL HILL ESTATE TONTINE.

Trustees—

John Clutton, Esq., Whitehall-place.
John Haekblock, Esq., Bolton-gardens.
John Horatio Lloyd, Esq., Inner Temple.

ALEXANDRA PALACE.—A Charming Palace with about 500 acres of beautiful land (Freehold) within 6 miles of Charing-cross.

ALEXANDRA PALACE.—This will be a Grand Institution of healthful recreation and elevating instruction, combining the solid advantages of the South Kensington Museum and Schools of Art with the lighter pleasures and pastimes of the Crystal Palace at Sydenham.

Some of the advantages to the holder of a Tontine Certificate for ONE GUINEA (and upwards) may be thus described:—

1. A Share in the division of the Estate in 1886.
2. Free Admissions, according to the number of Rights.
3. A Share or Shares in the proposed valuable Art Unions.
4. 20s. returned for every 21s. paid, in event of death of nominee.
5. Ample Endowments, &c., for Children; or a very large return for the capital invested, may thus be secured.
6. No risk or liability whatever.

Money returned in full, if issue is not made.

For further particulars, see Detailed Prospectus.

Admissions to view the Palace (which has one of the largest and most perfect Organs in the World) can be obtained at the Offices of the Company, 5 and 6, Great Winchester-street-buildings, London, E.C.

THOS. DIXON, Secretary.

THE BUILDING NEWS.

LONDON, FRIDAY, SEPT. 8, 1871.

CRYSTAL PALACE TEACHINGS.

IT is no disparagement of the ambitious artists who originally planned the Crystal Palace at Sydenham to say that their highest hopes have been disappointed. They indulged in a splendid dream, which by degrees has melted away. A structure so vast that it might have been designed by the builders of Babylon, and so airy that it created an idea of enchantment, rose on the summit of the brightest hills overlooking London, and contained an illustration of history in all epochs, manners in all aspects, art in its most antique and its most modern forms, costumes in every region of the world, vegetation as it springs in every climate, industry as it has been developed by every race, age after age. This was indeed *epitome mundi*. It was expected that teachings so new, through so brilliant a medium, with all the help and fascination of comparison and contrast, would inspire the multitude, and lure it into the arcana of learning. Egypt was presented to view, in temple and image, colossal, solemn, mysterious, hieroglyphic; its entire life, its births, its marriages, and its deaths; its feasts, sacrifices, and funeral rites; its dwellings, tombs, and coffins; its fortresses, wars, and arms, vividly pictured on wall and column; set forth in mummy cases and models, and made familiar by collections of genuine implements and utensils, jewels and trinkets, dug by antiquarians out of oblivion. Assyria followed, with its glimpses of the great Scriptural story, and its mimic monuments, it was expected, would be eagerly studied by a generation which had been intent upon the Nineveh excavations, and was believed to follow with enthusiasm every ray of light, however broken or discoloured, that fell from actual history upon the pages of the Bible. So, with the exhumed architecture, the comfort, the luxury, the religion of the Pompeian household. These wonders of the past, with the golden-fretted, flashing, thousand-tinted roofs, the marble floors, the fountained courts, the Moresque arches, and the crimsoned windows of Seville, kindling the rich interiors, as it were, into an atmosphere of iridescence; the cool Roman halls; the Virginal porticoes, snow-shafted and slowly mellowing in the sun of Athens; the magnificent trickery of the Byzantine era; the mingled witcheries of the Renaissance; the Italian, with Angelo's giants; the Gothic—all carved, door, window, pulpit, and tomb—all these, it was imagined, would constitute an academy of the people, tempting them to the sources of knowledge. We are bound to confess that, in a serious degree, the experiment proved a failure. Nor is it to be wondered at. The myriads went to see a show; but they were no more qualified to appreciate the lessons laid out before them in alphabets of mystic signs, Grecian urns, mortuary swathings, Eastern and Western styles, the rings of Roman ladies, and the votive-altars of Pompeii, than to decipher the Moabite stone. They went, and saw, and stared, and then gathered about the orchestra, or, as do nine-tenths of the visitors to International Exhibitions, loitered in the vicinity of refreshment counters. Too much had been attempted with the material which had to be worked upon. It was not reasonably to be anticipated, in point of fact, that the popular mind would fall at once into grooves prepared for it by men among the most erudite and refined of their day, with whom culture is a habit and taste a passion. The spelling-book had hardly been put in their hands before they were called upon to translate the very Vedas of the remotest human civilisation. It was curious to witness the

earliest effects of this mute lore, scarcely less unintelligibly interpreted by the shilling manuals. Crowds passed in and out through the Egyptian and Assyrian colonnades, the Attic and Tuscan doors, the gates of the Alhambra, of the Goths, and of the Italian revival, but they displayed more real sympathy with the denizens of a South American or Central African hut, with an Esquimaux or Samoyede in his canoe; the bear-hunter in his snow cave; the earth-eaters of the far Western Mountains, or the tent-dwellers of Tartary. These were portraits of living races, not shadows of centuries and nations long passed away, their very languages dead, their creeds extinct, their men and women surviving only in pallid statues and busts, and names utterly dissociated from our common thoughts. The Egyptians and Assyrians, the Greeks and the Romans, as they existed in their public and domestic economy, are even less to ordinary persons than are their myths and fables, for these impress the fancy. Therefore, while a certain elevating influence may have been exercised upon fragments of the masses which, during so many years, have drifted to and from the Crystal Palace, we are justified, we think, in the opinion that large expectations, pleaded as the excuse for a dead-waste of expenditure, have been dissipated and will never in the future be realised. This is not to suggest that those arches of glass, those galleries of iron, and all the countless objects crowded within them, did not add a beauty and a treasure to the most delightful of metropolitan neighbourhoods. There was an immense field of studied decoration; there were gardens choicely planted and exquisitely planned; fountains of artistic arrangement; music in which no inferior minglings were at first permitted; some good sculpture, though never except the vilest paintings, marked with prices that seemed ironical; a generally noble and sparkling vista; many curiosities; examples of manufactures from the four quarters of the globe; two towers, which were prodigies in themselves; and an immense cellar full of machinery that might almost as well not be there, for anything that the holiday throngs care about. But these attractions did not suffice. Nor did it much avail when the Crystal Palace obtained the privileges of a bazaar, and strangers were pestered to buy what they had only come to see. People lounged lazily amid heaps of dazzling plate, and mirrored surfaces ablaze with Venetian and Bohemian glass; they eyed the stiff brocades of Albania, and the monstrous panoplies of China and Japan, with something like equal wonder; they glanced at the native armoury of India, the equipments of the Greenland fishermen, the arrow tubes of the Asiatic Island savages, the whaler's spear, the Indian weaver's loom, the Chinaman's lathe, and the Dyak's sword, as things proper to be seen, pencilled in the catalogue, and mentioned at home; but here the attraction ended, and yet the palace did not fill. Monstre classical concerts drew for a season; the edifice, owing to its enormous extent; its superb position, whence it gleamed like a jewel far and wide round London; its ample gardens, propitious with light and shade; the facilities for reaching it; and its generally glittering character, within and without, became a favourite centre for festivals. It could never overflow; no number of schools would find it not big enough for their annual treats; it had a welcome for armies of Foresters and Odd Fellows. Fifty societies might dine in it separately and simultaneously. It was the very place for the presentation of testimonials. The sovereign potentates of Europe on visits to England may be said to have held their popular receptions at the Crystal Palace. The Royal Dramatic College, upon a few occasions, celebrated its mummeries there. All would not do. A few grand days did not suffice. Tight-rope performances, oriental juggling, a dead

gorilla and a live chimpanzee, a dancing platform, bicycle races, and fireworks, were superadded, with theatrical entertainments, and every novelty as it sprung up, and the palace is now decidedly an established, if not a too flourishing, institution. But we hear little of the intentions avowed by or attributed to its founders. It no longer professes an ostensibly educational purpose. Conceding this, we maintain that it has not lost its educational capacity or value. For, if the neglect of its historical, art, science, and industry treasures be a reproach, the reproach applies more or less to all our grand structures and their contents, which might be supposed to represent a world of teaching. The truth is, that the multitudes who explore them are not taught up to the level at which these silent lessons would begin to tell upon the intellect. Their principal motive is curiosity, love of sight-seeing, and fondness for the new. In one and the same spirit they swarm into Westminster, the British Museum, the National Gallery, and the Courts of South Kensington, exactly as they would into St. Peter's at Rome, the corridors of the Vatican, or the Coliseum itself. In one and the same spirit would they marvel at the Falls of Niagara, or the crater of Mount Vesuvius, or the icebergs that rock and nod in the Polar oceans.

To begin with, set holidays are not intended to be opportunities of study. Men do not think in large bodies, or when their families are about them with views of pleasure. Nor can any great results be looked for even from parties conducted round a building by well-meaning gentlemen undertaking to explain its contents. The information thus conveyed must necessarily be superficial, and addressed to a few. Intelligent individuals, in twos and threes, ranging the Crystal Palace for half a day, perhaps, of thoughtful hours, might take away useful and permanent teachings, especially if watchful of the fresh elements introduced, and the new pages illuminated in that vast missal-book of history. Thus, it often gathers the first fruits of travel, as from Polar explorers, and, most recently, from those who have been journeying over the loftiest uplands of the earth, in Yarkund, amid the most dreary of all wildernesses, mountain deserts. Who made those excellent roads, constructed those curious roofless huts, designed those citadel-monasteries, erected those picturesque granges on the valley sides, heaped those religious little cairns, friendly to the wayfarer, cultivated those gardens, worthy of Damascus, wove those sparkling tissues, forged that trenchant steel, reared those amply-furnished towns, wherein the houses are luxurious with imitations of European furniture? A people whom we are pleased to term barbaric, yet who possess secrets which civilisation has never mastered. We commend the Yarkund Court for a careful examination. That completed, a turn may be taken from the heights called, in that cloud-piercing region, "the roof of the world," down to the depths and recesses of the ocean in the aquarium; but of this not much can yet be said. The finest, in every respect, that we have seen is at Havre—an exact representation, within and without, of Fingal's Cave in the Isle of Staffa, with a fragment from the Giants' Causeway as an approach. There the tanks were grottos, teeming with marine life; the atmosphere, the light, the colour, all was of the sea; you appeared to be walking beneath waters, in the midst of their inhabitants, in every phase and stage of life, with their forests, their gardens, their landscapes, and their homes. The aquaria of Brussels, of Antwerp, and of Hamburg, though the last has acquired an unaccountable reputation, are as nothing in comparison with it. That at the Crystal Palace is, at present, a delusion, being comparatively empty, but may be expected to enrich itself by degrees; indeed, in point of sub-aqueous architecture, great progress has been made, though the

general effect of the interior too closely resembles that of a corridor in a model prison. Not the slightest effort at artistic or illusory effect relieves the straight, narrow, pale-painted perspective of oblong tanks on one side and dead wall on the other. It is not thither, as yet, consequently, that we would send the searcher after instruction, especially since the entire structure breathes its thousand teachings in every moment of the day, even if we demur to the boast of the management that it comprehends all that is worth seeing in art or nature, from pictures to mechanical pianos, from Assyrian architecture to acrobatic agility. These gentlemen, we believe, have invented a phrase to cover the retreat of the Fine Arts from their programme; they have "cast off many affectations." But they have not cast off all. The student at the Crystal Palace finds an infinitude to reflect upon in the edifice itself; the battle which the builder had to fight against the peculiarities of the soil and the inequality of the levels, in the foundations, in the methods of ventilation and warming, in the tinting of the interior, the disposition of ornament, and the arrangement of sculpture. In this last class, where so many objects are gifts, we must expect to discover much that is unworthy; but it is not a barren vista that gives us the ideal Shakespeare of Roubillac, the Frankfort monument to Gutenberg, Faust, and Schoeffer, Clesinger's Francis I., Thorwaldsen's Venus, the renowned statues of Gattamelata and Colleone, the Farnese Hercules, and the Farnese Flora. But these are rather specimens to admire than to be taught by. We have already referred to the Fine Arts Courts, the Egyptian typifying solidity, obscurity, and cavernous coolness; the Greek exquisite in its colours, blue, red, yellow, gold, and embellishments delicate as poetry; the Roman, all grandeur, representing the men who, under Grecian masters, taught us the architectural secret of Asia—the arch—and who dug bright colours out from the natural quarries of the earth; and the scarcely-restored Alhambra, built, as it were, between the East and West, and born of a similar union—a style which would never serve in England, as being irreconcilable with the ideals of Christendom not less than with all domestic customs of the West, and costly beyond conception. Still, amid this efflorescence of diapered splendours, floral scrolls, knots and wreaths, flowing and glittering lines, stalaetite fringes, and even the picturesque Cufic characters, lurk myriads of dainty suggestions which the art-worker might well take to memory, for dextrous introduction in new designs. The manipulation, to commence with, is perfect. Though derived from the Byzantine, a quick eye will at once discern that, while equally gorgeous, it is infinitely more elaborate; but the Byzantine Court is as yet in only a partial state of restoration, though elsewhere the wondrous mosaics of that school glow with their saintly legends upon deep-toned walls rising from floors of marble inlay. Let the visitors—supposing them to form, according to our idea, a small group, intent upon each separate significance of this enormous repertory, continue on, even though the Coldstream drums are thundering in the Rosary, or the Vokes family are burlesquing in the theatre, and leaf after leaf in the history of art unfolds itself, each deserving the study of hours; the great chancel arch of Tuam, the Ely doorway, the beautiful Heisterbach fountain, the Mayence and Augsburg gates, the cloister of St. John Lateran, the carved panels of Hildesheim, the effigies of Fontevrault, Cimabue's vault, the Norman fort at Winchester, the German architectural relics, all telling their tale of human fancy in its every mood—reverential, grotesque, daring, imitative, passionate, tender, or dreaming; and through these we seem to reach, so to term it, the Nature of

Art. More than this, the English Mediaeval court bears magnificent witness to English genius in the past—the Rochester doorway, the Angels' Choir from Lincoln, the Chapter-house at Wells, the Hereford and Salisbury monuments, and the niches and canopies from Beverley Minster. Compare these, for the sake of contrast, with Brunnelleschi's Dome at Florence, the Bourgtheroulde façade at Rouen, the Doria doorway at Genoa, and the Cinque-cento work from Pavia. It is like a journey through a panorama, one set of illustrations succeeding another before the impress of the first has been weakened. Many an Academy lecture teaches the listener no more than he can here learn by the moment's transition from Fontainebleau vestibules to Perugian ceilings, from the grace of Gonjon's nymph to the horror of Pilon's Graces. At this turn you cut amid the pierced-stone-work, warm interiors, and massive carving of the Elizabethan time, and that among the florid loggias and fountained courts of Italy. The contrast forces the growth of thought in any mind not utterly warped by the gin-palace architecture of the period. But, at this point, a complaint is reasonable, on the part of those who have been educated up to the level at which the treasures of the Crystal Palace become practically interesting, yet who may not have mastered Dr Smith's encyclopædias of antiquity, against the pedantries flung in their faces. Why make a show of Latin words to designate court-yards, back-doors, bed and dining-rooms, flower-gardens, baths, passages, and lavatories? Why bother the hurried working-man with *cubicula*, *posta-portica*, *fauces* and *trichinia*? There is too much of this, as well in the technological and natural collections, which are very much neglected, very much out of the way, being no better treated than the "picture gallery," or section of an upper floor assuming that title, but which merit the closest attention, though not to be compared with the Kensington Cabinets. The inquirer is pretty sure to be uninterrupted here, except by the rustle and hum from the transepts below, where the conductor wields his stick as though he were defying the four corners of the world in arms, and scalping their champions. Passing on, the picture brightens into life, and the zones of the earth exhibit their peoples, their manners, and the special gifts of God, the wild races, the creatures consorting with them, the products of the earth, the homes, clothing, adornments, arms, household economies, fruit, vegetables, animal food, arts, manufactures, and inventions of necessity characteristic of their rude and monotonous lives. Compare those huts and cabins, and their uncouth contents, and those frail canoes, with the array of shell-shaped carriages, all softness and lustre, the perfume fountains, the glitter of kaleidoscopic glass; the services of painted egg-shell china, the sumptuous furniture, the costly toys, and the innumerable nameless trifles which are as honey is to the bee in the more luxurious hives of the East and the West around which expand the cold circles of barbaric existence. Here are teachings. Although, therefore, we have confessed what the Crystal Palace is and must be for the many if its lustrous arcades are to remain open, we think there were reasons sufficient for claiming on its behalf capacities which may yet go far towards justifying the hopes of its founders.

THE DOME IN POINTED ARCHITECTURE.

AMONGST the small and unfashionable minority who look on Gothic principles, not as articles of faith transcending reason and demanding absolute and unquestioning obedience, but simply as rules laid down by the human intellect of one age, and capable of being revised or improved by that of another, it has long been a question why they should not be applied to domical construction. It may perhaps be

answered that the use of the dome would imply the abandonment of all the Mediaeval features which had their origin in the cross vault, such as the buttress, the pointed arch, and perhaps even the gable. On examination, however, this position will, we think, prove more plausible than true. Even as regards the buttress, we doubt it. In a polygonal dome, with ribs at the angles, the main thrusts may certainly be collected into points and resisted by buttresses; while even in a hemispherical one, the same end might be gained by a skilful use of leaning arches. As to the pointed arch, however, the case is still plainer. It is no question of theory here; the pointed arch and the circular dome have been, as a matter of fact, combined in more styles than one. Just by way of calling attention to the subject, we will notice a few instances of their combination.

The earliest in point of time are probably those supplied by the Saracenic architecture of Egypt, and the best known examples are the mosques and tombs at Cairo. Amongst these may be found domes either circular or pointed in section, used, in each case, sometimes with round and sometimes with pointed arches. At the Barkauk Mosque, Cairo, both domes and arches are of the latter class, the points, however, being obtuse, and only just perceptible. The great dome, as usual, is considerably stilted, and its tambour, or upright face, is pierced by a range of lights. As usual, too, it is completely visible on the exterior, for the Mahometan builders, unlike the Romanesque ones, did not enclose their domes in a tower to serve as abutment. They so constructed them as to stand alone, thinning and lightening them towards the top, and weighting them near the base, so that even after their supporting walls are rent and decayed, some of them still stand as perfect as if they had been hollowed from one vast block of stone. Their base is usually square, and the transition from the rectangular to the circular plan is managed in several different ways. Externally, the square is often brought into an octagon, by sloping braches, like magnified chamfer stops; but these, instead of being mere weatherings, as in a Gothic spire, are more frequently formed by a series of bold mouldings. On this type there are several variations at the tombs of the Caliphs, a mile or two from the city of Cairo. A different type, also common, is found at the Mosque of Hassan, and in this the square is carried up without alteration, and finished with an elaborate cornice; but, whichever plan is adopted, the dome rises clear of the summit. Very often it has no abutment whatever beyond the material contained in its own thickness. This, at the Barkauk Mosque, is about 2ft. 6in. in the tambour, or upright cylindrical portion below the springing of the curve. The wall of the square area beneath, at the same place, is not less than 6ft. thick, and if it received the direct thrust of the dome, would be amply strong enough to counteract it. But the point at which, according to all ordinary calculations, this thrust tends to operate is many feet higher up. It is considerably above even the line or springing at which the curve commences; and yet even between the springing and the thick wall there is almost always, in these Egyptian buildings, a long stilt or upright surface, perforated by a range of windows. How these domes contrive to stand, and especially how some of them outlast the partial ruin of their supporting walls, is therefore in part a mystery. It certainly cannot be explained on ordinary theories of equilibration, but probably depends on the jointing of the stone, the skilfulness of the workmanship, and especially the tenacity of the connecting cement. At any rate, the durability of these buildings, some of them little less than a thousand years old, in a country where earthquakes are neither so rare nor so slight as they are in our own, says much for the strength of domical construction. It might

have puzzled the ablest of Gothic masons to raise a wide cross vault, with no abutments, on four or five yards of thin upright wall, and had the feat been accomplished, we question if it would have remained, even under the most favourable conditions, for modern eyes to see. The great dome at the Mosque of Hassan is about 70ft. in diameter internally, and though in this instance the tambour is somewhat thickened by a complicated system of offsets, the addition is certainly not enough to render it stable by the mere effect of gravity. Of course, none of these domes had a cupola on the top, to weight them in the one place where of all places weight most needs to be avoided. They have not (or at least most of them have not) even a horizontal crown. They are slightly pointed in section, and turn up, on the outside, into a delicate ogee, ending in a bronze finial. The largest of the mosque domes, however, are not those which are most closely connected with our subject. Springing from a square area enclosed by walls, they do not illustrate, so well as some of the smaller ones, the use of domes in conjunction with arches. Such arches as are connected with them are naturally those of a secondary class, and of a span no greater than that of an ordinary door or window. But there are other domes to be found in these Mahometan works which have a vital and structural connection with arches, being supported by them entirely, and being connected with them, as in Byzantine works, by domical pendentives. The difference is, that in the Greek churches the arches are semicircular; in the Egyptian mosques they are as frequently pointed. This is the case, for instance, in the sanctuary of the Barkauk Mosque, where each dome rests on four piers, and is carried by four pointed pier arches. There is no string-course, and no difference of curvature, above their summits; the same dome which spans the area is continued down to the springing to form pendentives. The effect, though apparently artless, is very pleasing; the work is substantially done in the most unpretending way, and this simple style of construction has a grace and repose which are rarely found amidst the complicated groin ribs of the later Gothic.

Almost the same combination which prevailed in the edifices of Mediæval Cairo still finds favour in those of modern Persia. There, too, the pointed arch and the dome are used together, though the curve either of one or both is generally compound, instead of being simple. The four-centred arch, in fact, has been almost universal there, until the upper part of the curve, growing flatter by degrees, has become absolutely straight, and the arch has become an angular one, with merely the haunches rounded. We do not mention this peculiarity to recommend it, for though compound arches are often convenient, they are rarely beautiful. The influence of custom is needed before we can even appreciate the work in which they exist, and allow for the real excellences which may exist even under this strange and unpossessing disguise. The Persian architecture of the last three or four centuries shows in abundance the faults of a decaying style. It is "late" and "debased" in the same sense in which our own Tudor architecture is so; but, like it, it contains some magnificent and suggestive ideas for those who can distinguish an idea from the mode in which it may happen to be expressed. Nothing which it contains, however, seems more suggestive than its combinations of domes and arches. Of the former, some, though not many, have the plain pointed profile, as in certain parts of the Great Mosque of Masjid-i-chah, at Ispahan. Here, for instance, is an apartment square on plan which is brought into an octagon above by four-centred arches spanning the angles, and upon these is placed a dome differing little in section from the principal ones at Cairo. The Pavilion of the Eight Gates of Paradise, Ispahan, in spite of its faults of style, is a work of striking

beauty. It is octagonal, with the oblique faces of the octagon considerably narrower than the rest. Each of the longer ones is open to give entrance, and is spanned by a great four-centred arch. A passage of the same width leads from each archway to the exterior, forming, in fact, a corridor roofed by transverse ribs similar to the arch. But though there are four great archways leading into the apartment, they are not all alike. Two, opposite to each other, are lofty enough to cut into the dome which spans the interior: the other two are only half as high, and have a gallery above them. Over this gallery, however, the arches are repeated, springing from and rising to the same levels as the two loftier ones, while the diagonal faces are widened out by other arches, so that the lowest point of the dome may be considered as resting on a symmetrical octagon. The dome itself is a wonderful specimen of corbelling over and honey-combing; there is scarcely an inch of flat surface about it, and no description unaccompanied by views can convey any notion of its appearance. It is lighted from above, in a striking and effective way, by a circular lantern opening into a large ring near the summit. The bazaar of the tailors, Ispahan, is very similar to this in arrangement, but much simpler in detail. It illustrates what is one of the peculiarities of Persian dome construction—namely, that the pendentives do not always stop at the apex of the supporting arches. On the contrary, they often continue to rise, and to converge inwardly for some distance beyond, so that the dome which is planted on them, instead of corresponding on plan to a circle touching the inner faces of the walls, is much smaller, and sometimes not more than two-thirds or even half the size. In the bazaar at Kacham, Persia, there are some remarkable applications of the pointed dome. It seems, in fact, to have been used in all sorts of situations, treated with the greatest freedom, made to bend and adapt itself to almost every shape and use for which a roof covering could be required. Thus we not only see domes on octagons and irregularly canted squares, but, in the great hall of the bazaar last referred to, even on an oblong more than twice as long as it is wide. Practically this is covered by three domes side by side, but there are no great transverse arches to separate and support them. There are mere mitre lines or arrises where one dome intersects with another, and even these are so faintly marked that they would scarcely show in an outline section. From all these and many other instances one fact is clear, that the Persian builders found the combination of domes and pointed arches a thoroughly practical and useful one, capable of being applied to the most various and widely-differing circumstances. They thoroughly mastered it in all its variations, and though, unfortunately, they worked in a degenerate and decaying style, they have done quite enough to show of what admirable results the system is capable.

Should any one think it a fault in the combination under notice that it was originated by Mahometans and misbelievers, we may remind them of a more orthodox application amongst the churches of Southern France. S. Front, Perigueux, and the long list of ancient buildings which are closely related to it, shew the same type in a form perhaps better fitted for our instruction. Why, before the origin of the Gothic styles, these buildings came to exhibit pointed arches, is a question perhaps hardly yet decided. Mr. Fergusson has made the important suggestion that in this early instance, as well as in the later and far more familiar Gothic one, the form was introduced for structural reasons. It has, at any rate, structural advantages for the purpose; and in connection with the dome, too, it has great artistic merits. Roughly and barely as it is sketched out in these early examples, a more beautiful com-

bination of lines can scarcely be found. If we want a new and untouched basis for modern art, here it is. Even with no ornament at all it is surpassingly graceful. The mere form and shadow of a dome on pointed arches are enough to constitute an admirable design by themselves; they do not ask for decoration to make them passable. Yet, on the contrary, they do not shrink from it. There is no better field for wall painting and mosaic than these grand unbroken surfaces. They will not attract the third-rate ornamentist, the man who relies on tracery and trash to make his designs go down. But they will commend themselves to the truly practical one, who aims at fulfilling modern requirements, and fulfilling them in a permanent and lasting style. If we want to throw our churches open and fit them for modern uses, the dome has everything to recommend it, for by the use of domes it is always possible to have wide spans and few obstructions. If we want to make them dignified and ornamental, the dome will be of equal service; no permanent covering is so cheap, so easily constructed, or so strong. If we want, in short, to develop an architecture of our own instead of repeating the architecture of others, to explore a new mine of treasure instead of groping in the half-exhausted workings of the Middle Ages, we shall do well to turn our attention to the dome in combination with the pointed arch.

ECCLESIASTICAL DILAPIDATIONS.

THE objects of the Act of 1871 are the better sustentation of buildings that ecclesiastics are bound to repair, and the relief of such ecclesiastics. These objects are to some extent opposed, since the interest of the buildings and of the repairers are antagonistic, and every burthen laid upon a benefice taxes the beneficiary. Incumbents may, therefore, be glad to hear that no new burthen is imposed. The old machine is cleaned and lubricated, and a friction roller introduced in the shape of an official surveyor. The bishop, and under him the archdeacon, always had the duty of preventing dilapidation. Claim have always been made upon avoiding incumbents, but the business of reparation has not followed with uniform diligence and effect. To an incumbent who has obtained a benefice, and whose pocket swells with money received from his predecessor for dilapidations, the new law affords no relief, but the reverse. The archdeacon, the rural dean, and the patron, are each at liberty to complain to the bishop when the buildings of a benefice are out of repair, and the bishop can thereupon set the statute in motion by directing the surveyor to inspect and report. Upon the occurrence of a vacancy, or in the event of sequestration, the bishop has not to wait for complaint, but issues directions at once. The surveyor does nothing, it is to be noticed, of his own accord, but acts simply at the instance of the bishop. When directed to inspect a building that requires repair, he is to report:—"1. What works are so needed, specifying the same in detail. 2. What he estimates to be the probable cost of such works. 3. At or within what time or times such works respectively ought to be executed." Provision is made for objections from the parties concerned; but in the absence, or on the removal of objection, it devolves upon the incumbent to carry the prescribed works into effect. The cost must, of course, come out of the living in some way, but one form may be more inconvenient to the incumbent than another; and this circumstance has been so successfully dealt with as to afford him welcome assistance in case of need. It will often, no doubt, be a relief to the holder of a poor benefice to know that he may borrow of the Bounty Office, if the governors see fit, the whole or part of the cost of the works and attendant expenses, at a low rate of interest, and spread the repayment over a term of years, proportioned to

the peculiar case. Saving default on the part of the incumbent, it is only where the living is sequestrated that the surveyor has to undertake the actual conduct and superintendence of the repairs. His services here are indispensable, and the law has made the support of buildings next in precedence to the ministrations of the Church.

Where an avoidance takes place, the course adopted will be entirely new. The bishop instructs the surveyor to settle the amount of dilapidations with the outgoing incumbent or his representatives, and get the same paid, through the hands of the successor, into the Bounty Office, there to await application. This, again, is a matter which, to an entering incumbent, may well be designated a relief.

It is strange that certain of the provisions of this Act should already threaten difficulty, and call for practical solution; but such is the opinion of the rector of Strathfieldsaye (BUILDING NEWS, Sept. 1). The authorities in the diocese of Winchester having first appointed a surveyor for the whole see, proceeded to discuss the duties he would have to perform, and the charges to be made. Upon the subject of duties the Act is explicit, but leaves the remuneration to be settled by those who make the appointment. The dignitaries can hardly receive credit for a very careful reading of the Act, since, according to the rector, "there was upon the minds of those who on that occasion considered the language of the Act no doubt whatever that as the relief of the clergy was the main issue, the purpose of the Act was that the surveyor under the Act should be the person to direct the repairs." Section 19, on the contrary, says, "In case of a benefice not under sequestration, it shall be the duty of the incumbent to execute the repairs prescribed in the final report, in the manner and at or within the time or times prescribed." Nothing could be clearer than this, and among the reasons may be adduced the scrupulous care displayed throughout the statute to avoid needless interference with the independent action of the clergyman in relation to his freehold. The official surveyor acts in the interest of the Church, or of an unknown reversioner, and in some sense as a key to the coffers of the Bounty Office; but so that the temporalities are adequately sustained, he will be found to influence in a very faint degree the will of a resident and responsible incumbent. It may in certain respects be better that this independence should continue, and that when broken at all, it should be at the express desire of the clergyman. It is quite revolting to suppose that a very trifling difference in the dimensions of timber or in the quantity of other material might result in the withholding of the certificate of protection after the money was paid. To remove so injurious an assumption, the Winchester surveyor appears to have explained that for the information of the bishop, or the governors, and for the purpose of a general financial and not executive estimate, such as he is called upon to give, the minuteness appropriate for a contract would be unnecessary. The establishment of a rateable charge of about 5 per cent. for directing repairs seems, therefore, only just and reasonable. It agrees with the scale adopted for the probationary term of one year in the diocese of London, which it may be convenient to annex. "FEES AND CHARGES, DIOCESE OF LONDON.—§§ 12 to 15, or 29 to 31. For work required, together with one copy of report, £5 5s.; for other copies, and sending the same, per folio, 4d.—§ 22. For each inspection and report, £2 2s.—§ 44. For each certificate, 10s. 6d.—§ 45. For each certificate required, and for executing work here provided, 5 per cent. on outlay.—§ 46. For certificate, and making and sending copies, £2 2s.—§§ 50 and 51. For certificate, and making and sending copies, £2 2s.—§ 52. For certificate required, £2 2s.—§ 54. For valuing for insurance, £1 1s.—§ 57. For certifying in triplicate, £3 3s.—§§ 58 59. For

inspecting under 58, if directed so to do, and for perusing counterpart of lease under 59, £1 1s.—§ 70. For advising the bishop as to consent, if employed, £1 1s.—§ 71. For advising the bishop as to consent, if employed, £1 1s.—For expenses of travelling actually disbursed."

FIRE-BRICKS.—I.

By CHARLES TURNER, C.E.

INTRODUCTORY REMARKS.

THESE bricks and other fire-clay goods are used for buildings, parts of buildings, or other receptacles required to withstand a great heat. No substance known in Nature is really infusible, but is only so in a relative sense. No substance has yet been discovered which cannot be melted, or frequently volatilised, before the oxyhydrogen blowpipe, or between the charcoal points of a galvanic battery. The degree of fusibility which any substance exhibits is, of course, mainly dependent upon its chemical composition; but it is dependent almost, if not quite as much, upon the way in which its component parts are mechanically, so to speak, combined. The most refractory or infusible substances known are probably pure silica, pure alumina, pure magnesia, and pure carbon. It is by taking advantage of the natural or chemical, or the most perfect mechanical union of the above-mentioned substances, that the best fire-bricks or other fire-clay goods are manufactured. It is to be regretted that no regular series of experiments have been carried out, or at all events published, showing the relative heat which pure silica, alumina, magnesia, and carbon will withstand without fusing or running into a glass. Such an experiment, sufficient for all practical purposes, might easily be tried in one of Siemens's regenerative furnaces, the heat of the hearth being sufficient to run any description of fire goods subjected to it. In mentioning silica, alumina, magnesia, and carbon as the substances capable of resisting the greatest heat, it is supposed that a dry heat is applied—that is to say, a heat uncombined with any flux. Silica subjected to heat, and at the same time to an alkaline flux, melts easily and runs into glass. Pure alumina is very difficult to procure; it is not so much affected by alkaline fluxes, but it is readily melted by fuel containing substances which combine with it chemically. Pure magnesia is very infusible, and adds a degree of infusibility to other materials with which it is combined, especially with silica. With iron pyrites as a flux, and wood fuel, it is, however, readily melted. Carbon, in the form of hard coke or graphite, is also very infusible, but combined with silica and lime it is readily volatilised. The most refractory fire-clays for general practical purposes are those which contain silica, alumina, and magnesia chemically combined, to which a certain proportion of carbon is added, for a mechanical purpose, which I will describe more fully presently. An inferior description of fire-brick, suitable for many purposes, may be manufactured by combining strong plastic clay, tolerably free from iron and lime, with silica in the form of sharp coarse grit, consisting, as far as possible, of pure quartz. When exposed to a great heat, especially if it be a reducing flame, the silica is apt to act as a flux on the clay, and cause it to run. This is the case generally when clays are only mechanically combined with silica, magnesia, lime, or iron. The most important quality for a fire-clay to possess is, no doubt, that of infusibility; but infusibility alone will not enable it to resist the action of great heat, especially if it is formed into large masses. The particles must, then, be so combined together, that they will not crack or part asunder under the expansive force of the heat applied. To produce such a combination is the great secret of making a good fire-brick.

THE BEST FIRE-BRICKS.

Some of those which are best known and most in use are the Dinas Silica bricks, which are probably the most infusible under a dry heat, but will withstand very little pressure, and are useless when fluxes are used; Scotch fire bricks, Welsh ditto, Newcastle ditto, Stourbridge, Ewell, Windsor, and Poole fire-bricks. Excellent fire bricks are also made in Belgium, Prussia, and some parts of France, but English fire-bricks are always preferred for the most important work.

COMPONENT PARTS OF SOME OF THE BEST FIRE CLAYS.

Name.	Silica.	Alumina.	Oxide of Iron.	Lime.	Magnesia.
Dinas Silica ..	91.95 ..	8.05 ..	Traces ..	— ..	— ..
Welsh	80.10 ..	17.90 ..	1.00 ..	1.00 ..	— ..
Newcastle	69.25 ..	17.90 ..	2.97 ..	7.58* ..	1.30 ..
Stourbridge	70.60 ..	26.00 ..	2.00 ..	1.40 ..	Traces ..
Windsor	84.65 ..	8.85 ..	4.25 ..	1.90 ..	0.35 ..

THE POOLE CLAYS.

The Dorset clays, principally found in the neighbourhood of Poole, are largely used in the manufacture of fine earthenware. Some of them are capable of withstanding a very great heat, more especially that known as the Beacon Hill clay. The Beacon Hill works are about two miles from Poole Junction Station. The hill itself rises to a considerable height above the adjacent land, and the excavations are carried into the face of it. The clay in the lower ground is of an inferior quality, but when the excavation attains a depth of from 20ft. to 25ft. on the face, it cuts a bed of clay termed in the neighbourhood Lambeth clay, as it is sent to Lambeth for the use of the stoneware potters. It is from 3ft. to 6ft. thick, according to its position on the ground. The best of it is selected for the manufacture of fire-bricks; it is composed of 98.50 parts of silicate of alumina, and 1.50 parts of organic matter. This silicate of alumina contains approximately silica 63.00, alumina 33.50, oxide of iron 1.00, magnesia 2.00, lime 0.00. There is a lower bed of dark blue clay beneath the bed of Lambeth clay, which contains about the same proportions of silica, alumina, and magnesia, with only traces of iron, and it burns almost of a pure white colour. It withstands fire rather better than the upper bed, but as it was worth 12s. per ton free on board when shipped to Runcorn for the Staffordshire potteries, it was too expensive to use for fire goods except for special purposes.

THE PRINCIPLE ON WHICH FIRE-BRICKS ARE MANUFACTURED.

This, briefly stated, is to make them as porous as possible, so that the heat may penetrate through them without creating an expansion which may be dangerous to the stability of the brick. This object is attained in two ways. (1st) By mixing with the fire-clay some combustible substance, such as saw-dust, hard coal, coke, or in some cases starch. These burn completely away, under the heat required for burning the fire-bricks, leaving cracks or cavities in the substance of the brick, in which the heated air and the fire-clay can expand. The more regularly these cavities are distributed through the brick, and the smaller they are, the more infusible practically will the brick be. (2nd) By mixing with the fire-clay some substance which is equally infusible, but does not contract so much as the fire-clay itself, such as large grit, as free as possible from iron broken sherds, known as "grog" in the Potteries; or better still, as at Beacon-hill, by using rough stuff, consisting of burnt, crushed, and sifted fire-clay of the same quality as that used for the brick. In burning, on account of the unequal contraction of the rough stuff and fire-clay, small cracks are left round each of the particles of the harder substance. It is better that the fire-clay should be well weathered or ground dry, and it is essentially necessary that it should be thoroughly mixed dry with either

* Water and Organic Matter.

of the above-mentioned class of substances before the water is added.

MODE OF PROCEEDING AT BEACON-HILL.— RUBBLING.

The local name for unbearing the surface of the clay. This is conducted in the usual way by throwing falls from the face and wheeling to spoil. Portions of the mottled clay, the purple clay, and the black loam forming the upper beds were used for making red bricks and tiles. The cost of rubbling averages from 3d. to 4½d. per cube yard, or from 1s. to 1s. 3d. per ton on the clay cut.

CLAY-CUTTING AND WEATHERING.

The fire-clay was of so hard and tough a nature that it could not be grafted in the usual way, but had to be cut with cross-handed cutting spades constantly lubricated with water. The bed, when reached, was scored across in from 8in. to 10in. squares. These scores were deepened to about 9in., and the balls of clay were then readily lifted from their beds and dropped into the clay-shoots, extending sometimes 30 or 40 feet to the end of the tramway. These shoots were kept constantly lubricated with water. The clay sliding down them arrived at the end of the tramway, and the balls were lifted into the trucks by tools, called in the district pugs, consisting of a spade handle with an iron point. The clay was then conveyed to the platform to be dried in the sun.

GRIT.

The first fire-bricks manufactured at Beacon Hill were composed of fire-clay and grit found upon the hill. It evidently consisted of the larger particles washed out of the sand on the upper part of the hill, and deposited in the hollows. It had to be carted for about a quarter of a mile down to the works, and well sifted and washed to free it from vegetable matter. The loading cost 6d. per cube, 7d. earthing, 1s. sifting, and washing 1s. 6d.; together, 3s. 6d. per cubic yard.

DEYING AND GRINDING THE CLAY.

After being thoroughly dried in the sun, the clay was removed to the mill, crushed under edge-runners, and screened at the same time. The edge-runners were of cast iron, about 3ft. 6in. in diameter, and weighing 25cwt. each. They revolved upon a central pier of brickwork in cement, surrounded by a cast iron pan, the bottom of which was formed of a framework, into which gratings of different gauges could be fixed. The clay falling through the grating was carried by a rake, attached by an arm to the central shaft, to a pit formed in the ground on one side, and lined with masonry. Two sets of scrapers worked in connection with each runner—the one set to draw the clay under the runners, the other set to scrape it over the gratings.

MIXING THE CLAY AND GRIT.

Four pug mills, worked by the engine, were fixed in the clay mill, and two bays were formed at the back of the pug mills, about 10ft. square each. They were about 2ft. deep, lined and paved with brickwork, and puddled at the back with clay. These bays were used alternately every twenty-four hours—the time required for the clay to soak. When required for use, the bays were filled to about one-third of their depth with water. The grit was wheeled in barrows to the head of the bay, and mixed in a heap with the ground clay in the proportion of six barrows of clay to four of grit. The heap was then well turned over with shovels, and when so mixed cast, with an upward throw, into the bay, so that the grit and clay might mix thoroughly in falling into the water. After leaving it for about twenty-four hours to soak, the surplus water was run off, and it was lifted into the pug mills. One man was required to feed the runners and one man to wheel the grit. These two men also mixed the clay and cast it into the bays. Two men were required to feed the pug mills and two

to wheel away. The wages paid to these men were from 2s. to 2s. 6d. per day, and the cost of mixing, soaking, grinding, and wheeling to brick tables, was about 5s. per cubic yard, including engine-power.

THEORY OF THE ARTS.

FORM AND FORCE.

(Continued from p. 381, Vol. XX.)

THE transition from geometrical ideas, or those of magnitude and form, to ideas of bodies in relation to force, is an easy one, and though the first is independent of the latter, the relations of motion to bodies cannot be understood without the aid of geometry. It has been said that every body in nature may give rise to geometrical as well as mechanical questions, and that if the universe were to become immovable, we should still have geometrical questions to solve. In my last paper I dealt with the subject of geometry in a practical sense, to show its universal applicability to almost all questions in which extension of all kinds—solid, superficial, and lineal—were concerned, as well as its valuable training for the mind and eye. Especially, the study of stereometry or solids was recommended to architectural students as the best means of obtaining just conceptions of form, and this constructive application of the science I alluded to as a far more rational way of studying the abstract part of the science than the dry definitions and verbal rules given in most treatises professing to be elementary introductions to the science. My readers will pardon me if I here refer to a few other properties that bear upon art generally, especially architecture. I have referred to the advantage of taking solid bodies as the best initiative in conceiving the properties, conditions, and relations of lines and surfaces, a most necessary preparation for the artist of formative design. Take, for example, the three solids, the tetrahedron (or triangular and equilateral pyramid), the cube, and the sphere, and see the inexhaustible field for the study of form they afford; indeed, we may resolve all the varieties of form as seen in nature into the elementary figures these solids give. Their sections produce the elemental types of all architectural examples and proportions—the primitive and resultant elements of all form. Again, trigonometry, the doctrines of polygons and the circle, embrace the most valuable properties of magnitude and form, while all problems of mensuration, both plane and solid, resolve themselves into the primitive conditions of these three elements—the triangle, square, and circle.

The sections of solids by planes I have already referred to as a study of the most important and valuable kind to the architectural student, as without such knowledge the mason and the carpenter must always possess an advantage of much power over their presumed instructors, from the empirical knowledge at least they have picked up. I would recommend all students to obtain a quantity of wooden solids, such as eubes, pyramids, cylindrical solids, spheres, prisms, and the like, and make a series of sections, beginning with those derived from the simplest solids bounded by planes, and proceeding to the curvilinear ones. These sections should be made by planes, first in directions parallel to the sides or bounding surfaces, and afterwards in various oblique directions, so that a classified arrangement can be made from them. The most valuable will, however, be found to be those sections produced by oblique planes at different angles, so as to suit different forms of base, as for ground plans and the ever-varying necessities of roofing. The positions and lines of hips and ridges resulting from peculiar angles of plan and roof surfaces, or the intersections of planes of different kinds and angles, and with curved surfaces, are often left to be deter-

mined by chance, and the ultimate effect produced is frequently disappointing, if not leading to other difficulties of a constructive kind.

But demonstrative proof can be afforded by a study of this sort of many of the theorems of geometry. Here are a few:—"The three interior angles of every triangle are together equal to two right angles." (Euc. I., 32.) "Parallelograms standing on the same base and between the same parallels are equal to each other." (Euc. I., 35.) The same truth as regards triangles. The Pythagorean theorem is another. "Similar triangles are to each other as the squares of their like sides." (Euc. VI., 19.) "All similar solids are to each other as the cubes of their like dimensions." "Circles are to each other as the squares of their radii, diameters, or circumferences." These and other truths admitting of demonstration may be elucidated practically through the eye.

Space and pressing professional engagements prevent the writer from enlarging on this most interesting and exhaustless subject; but the great importance of a knowledge of "Form and Force," as constituting the two great powers the architect has to deal with in his creative art, cannot be impressed too strongly. They are the two great ideas he has to seize, consider, and combine, both in an abstract and practical sense; all good architectural art is a combination of the laws of these two powers of Nature, to which archaeological studies and merely decorative art are subservient. In one word, geometrical and mechanical principles being the most universal, are also the most urgent and pressing, and even chemical action itself may be resolved into them. They are undoubtedly, however, the only two that are neglected in our modern professional art-training, and to the ignorance of which we must attribute the blunders of popular architects, their inconceivable whims, and the puerile absurdity of giving us a lifeless art, or piecemeal productions of it, in lieu of a rational and modern one. The opinions of unprofessional writers, and the educated portion of the public press, attest the dissatisfaction felt at some of our recent national works, and clearly show that our "architects" are not arrived at that standard of intelligence in reference to the application of scientific knowledge, and to the common necessities of our civilisation expected of them, which make other walks of professional life more esteemed. The public demand for utility and common appropriateness in a public building cannot be satisfied by Mediæval picturesqueness, or multiplicity of misplaced detail, or a hotch-potch of useless features, instead of unity of purpose or dignity of expression. The New Law Courts have, for example, come under deserved censure in this respect. G. H. G.

ART TREASURES AND THEIR PRESERVATION.*

THE preservation of art treasures is an obligation we owe to posterity. They are the sacred symbols in which can be traced the social, political, and religious status of our ancestors, and, though the literature of a country may perish and its records decay, still there are certain monuments amongst the art treasures of a nation which appear to defy the rust of time, and outlive even the memory of those whose genius and labour called them into existence. Now the object of the paper we are about to read is to call attention to the decadence which, under some form or other, has become apparent in many of the higher departments of our present schools of Art, for where the art itself is still in the zenith of its power and freshness, the elements and materials employed to give form and colour to the creations of the mind are frequently in themselves of a more fragile and perishable character than were formerly used, and this we date to the peculiar characteristic of the age—namely, that spirit of rivalry and competition amongst our manufacturers which leads them to pro-

* A paper read at the meeting of the British Archaeological Association, at Weymouth, on Wednesday, Aug. 23rd, 1871, by JOSEPH DREW, F.R.A.S., F.G.S., &c.

duce, irrespective of durability, inferior articles at the cheapest possible rate. The decadence, however, to which we more particularly allude, is especially apparent in the absence of durability amongst the paintings produced within the last century, for whilst the transcripts from Nature are quite as faithful, and the ideal conceptions frequently more elevated in character than many of the early schools, still we regret to say the works of our modern painters are, for the most part, doomed to a very limited existence—premature decay has already set in amongst them—and many of the noblest efforts of modern art are even now passed into a state of dilapidation beyond the restorer's art to repair. We know we have men who assert that art itself—taking the word in its most comprehensive sense—has degenerated, and that the art workers of the early ages possessed a more elevated conception of the beautiful than the designers of the present day, but we see no reason why we should endorse this opinion. We have no standard whereby to measure perfection, consequently our judgment can only be comparative. One country may decline in art, but the great wave of intelligence and genius will be found surging on other shores, and unlooked-for examples of excellence have been and will again be the result. To a certain extent, however, we have come to recognise an idea of perfection, and to believe that each particular department in the art world culminates at its own specific time. Sculpture is said by some to have reached its meridian of glory and perfection several centuries before Christ, when Phidias—the chief of the early Attic school—produced this Olympian Jupiter, and Praxiteles, the head of the latter school, his group of Niobe; but may there not be in this idea an excess of veneration for early art? Modern times have given to the world marvels of beauty; the works of Baily, Pradier, and Canova will go down to posterity as glorious specimens of art creation wrought by men whom England, France, and Italy love to claim as their children, and although the ideal in some opinions may not reach so high a standard as ancient Greek, still these works have become art treasures, beyond price to their possessors, and are as imperishable and as valuable for the purposes of education and archeology as those relics of the Athenian schools, the remains of which are so much prized at the present day. Without, however, presuming to be an art critic, and without being so enthusiastic as some in favour of ancient art, we cannot pass through the courts of the British Museum without being struck with the massive grandeur and classic beauty of some of the ideal creations of those men who have left us such a comprehensive syllabus, as it were, of primeval civilisation. Some of the sculptures in the Egyptian sanctuary, although upwards of 4,000 years old, stand before us as perfect in preservation as if the last touch of the finishing tool had just been given, and yet, notwithstanding their preservation and beauty, many of the works of our modern sculptors will bear a critical comparison with those of the same class, whilst like them they have become the imperishable records of our age, in which will he read the history of our art schools, and from which posterity will be enabled to judge of the elevation or decadence of our art productions. Now, as a rule, the works handed down to us by the painters of the sixteenth and seventeenth centuries, and more especially those of the Venetian, Roman, and Parma school, are well preserved. We can go quite as far back for examples of the painter's art as we can for those of the sculptor's, but they are not so familiar to us from the fact that very few are found in private collections, for paintings were not always the movable chattels and cabinet gems they are at the present day. In its earliest phases the painter's art was principally called into requisition for mural decoration—the delineation of battles and triumphs, or the representation of great political events, and these were usually painted on the interior walls of public edifices, and on the ceilings of the mansions of the great; but even these early works commanded much attention in their day, and the artists realised enormous prices for their productions. The earliest picture of which we have any authentic record is one painted 720 years before Christ, by Bularchus, and mentioned by Pliny. It represented the battle of the Magnesians, and this was purchased by the King of Lydia for its weight in gold; but as we have neither the size of the picture nor the particulars of the material upon which it was painted, we can form no conception of the price realised for this early work of art. Pliny, however, mentions another picture painted by a disciple of Antidotus, representing "Ulysses invoking the shadows of the dead," for which the artist refused sixty talents of gold, or about £11,000 sterling, and afterwards made it a present to his country. All these very

early productions, however, were in outline only, and it was not until Apollodorus, the Athenian, established a school for painting, about 400 years before our era, that the distribution of light and shade became a recognised principle of the art. Apollodorus was the first man who contributed to the glory of painting, and before he appeared there was no production of the easel worthy to be called a work of art. Alexander the Great was a munificent patron of the fine arts, and by way of encouragement, he gave a monopoly—so far as his own person was concerned—to Lysippus the sculptor and to Apelles the painter, and refused to permit any other artist to carve his bust, paint his portrait, or even to introduce his figure as a copy in any of their productions, without his special license or consent, and by these means men were stimulated to compete for true excellence. But, passing over these art treasures, of which so few examples remain, we come to those with which the world is more familiar, those marvellous conceptions of Raphael, whose works still preserve all their original delicacy and beauty. With very few exceptions, the productions of this prince of painters are in the same perfect state of preservation as when they left the easel, untouched by time, and undefaced by the work of restoration. Not only are the paintings themselves in such a high state of preservation, but the colours have such a brilliant hue of freshness that we can scarcely reconcile their beauty with the fact that three centuries and a half have passed since his great patron, Leo X., stood by his easel, watching the facility of his pencil and admiring his work, for even now the delicate bloom on the cheek of beauty, the harmonious colouring of the draperies, the semi-tones and half-tints, as it were, of the accessories and distances, possess a delicacy and transparency rarely to be found in the productions of other schools. The intrinsic value, however, of the art treasures bequeathed by this glorious painter to posterity does not consist simply in their high state of preservation and delicate work, but in the emotions produced by the contemplation of their conception and beauty; in fact, the effect produced by the study of a really beautiful picture upon the mind is never effaced; it becomes photographed, as it were, upon the imagination, and we can always bring to our remembrance some prominent incident in connection with its composition or general beauty. Raphael, like the Grecian sculptors in the purest era of their art, strove for that ideal beauty which is never to be found in individual nature, and which can only be represented by taking the most beautiful parts of the many to form one, and it is this desire to reach ideal perfection that Sir Joshua Reynolds says "ennobles the painter's art, and elevates him above those who can only reproduce by the mere exercise of mechanical labour." What we have said of the works of Raphael, as to their perfect state of preservation, applies equally to those of Correggio and to the productions of other schools of the same period; the works of the best masters in the Dutch and Flemish schools are also in the highest state of preservation, forming a very striking contrast to those dilapidated wrecks so frequently found amongst the pictures of our modern men. Now the great question is, where are we to look for the cause of this decadence? Certainly not in the decline of the art. If we could entirely disabuse our minds of that "halo" which schoolmen and enthusiastic art critics have thrown around the works of ancient art, and were to go through this year's exhibition of the Royal Academy, we believe we could point to canvases not wanting in the beauty and passion of Raphael, the sweetness of Correggio, the triumphs of Titian, the cool silvery landscapes of Ruysdael, or the golden sunsets of Cuyp—the mellowness of tone, which time alone can bestow, being the only element wanting to render many of them worthy of the admiration bestowed upon their early rivals. But will these modern efforts of the painter's art bear the same test of years as their predecessors have done? We have melancholy forebodings—amounting almost to a moral certainty—that they will not. Now, the old masters were chemists as well as painters; they were no tyros in the mysteries of the crucible and alembic; they knew from personal investigation, much thought, and direct experience, the nature and durability of the pigments they were using. Under their own supervision were their canvasses and panels grounded—under their own immediate direction were their colours selected and their mediums proposed. No element of care was wanting, no precaution neglected to make their works, not only worthy of their name to posterity, but durable in the highest degree. The artist-colourman, with his prepared canvas at so much per yard, coated with whitening and size, and his tube colours and megilph, so neatly put up, but which will not bear the action of light for a few years, was un-

known in these early days; and it was not until the productions of this particular branch of trade were made competitive in price and cheapness and became the order of the day, that decay commenced its ravages, and the durability of paintings could no longer be relied upon. In examining the preparation on some panels of the fifteenth century, we found the surface upon which the picture was painted much harder than the panel itself, whilst in modern panels it was quite the reverse. In the early panels the surface broke with a gelatinous kind of fracture, the edges of which were sufficiently hard to cut the fingers, whilst in the modern panels a fracture of the surface represented a soft marley appearance, and the preparation itself could be crumbled by friction or pressure. It appears, then, that this want of solidity in the preparation of canvasses and panels permits the colour to sink in, it extracts the medium used in working them, and thus the pigments become so non-elastic, that as the panels and canvasses contract or expand by the atmospheric changes so prevalent in this variable climate, so the colours are rent in all directions, and the fine network of cracks which we so frequently observe spreading over the surface of a picture would appear to be the first step towards its decay. Then, again, in the metropolis paintings are generally hung in rooms where the air becomes highly vitiated by the presence of large assemblages of human beings and by the pernicious influence of gas, and this is a very prolific source of destruction to these works of art, added to which even the air of London itself has been declared by competent authorities to be very prejudicial to the preservation of paintings, owing to the excess of carbonic acid and other deleterious gases in the atmosphere; and if this hypothesis is correct then all other crowded cities must be the same. In watching the progress of this decay in a modern picture we noticed that when these cracks once made their appearance their edges were immediately eaten away by becoming oxidised, and as the erosion went on the fissures gradually widened, and although a thin coat of the finest mastic varnish would for a while stop the process of decay, still we have even seen the varnish itself rent asunder by the contractive and expansive action of the materials beneath. In fact, so justly alarmed have the patrons of art become upon the question of durability of our modern paintings—for some of them have invested large fortunes in their purchase—that Sir Francis Grant, the President of the Royal Academy, has suggested that a chair for chemistry should be founded, and a professorship established in connection with the Academy, so that the painter's art might receive the assistance of the science of chemistry, in order, if possible, to check the spread of this terrible blight which is destroying some of our noblest works of modern art. This difference in the durability of paintings is painfully manifested, and can be readily studied by comparing the pictures of the Peel collection in the National Gallery—which are generally productions of the seventeenth and eighteenth centuries—with the Turner collection under the same roof, which may be called examples of our own day. In the former they are as perfect as when they were painted, whilst in the latter many are already in ruins. Indeed, the possessors of some of the best works of Reynolds, Turner, Wilson, Hilton, and a score of other modern men, look with increasing dismay on the widening cracks and fading colours of those otherwise matchless productions of art, and they feel they have a right to invoke the aid of the Royal Academy, whose Council is supposed to be the conservator of this particular art, to investigate the cause and point out the remedy for this gigantic evil, which is robbing posterity of the art treasures it is our duty to hand down to them in as good a state of preservation as possible. But, as we have said before, we do not believe that the art has waned, but we do believe that all this mischief can be traced to the present rage for cheap productions. The age in which we live is essentially an age of electro-plate and lath and plaster. The ancients built their houses upon rock; the moderns build them on sand. Quantity and not quality, expediency and not principle, are the prevailing characteristics of the present age. Those matchless carvings which Gibbons left for our admiration and instruction—the throne at Canterbury, and the choir of St. Paul's and Windsor—can now be imitated by machinery at a comparatively small cost over the price of the material. The portrait painter, with his hundred guinea portraits on canvas and panel, has been superseded to a certain extent by the photographer with his sixpenny pictures on paper and glass. The elaborate works of Benvenuto Cellini and his followers are supplanted by race cups and salvers, produced by the thousand at the factories of Sheffield and Birmingham. Lace work and tapestry, the

goldsmith's art and enamels, stained glass and ornamental china, and even architecture itself, have all lost a certain amount of their native dignity in the art world through the inundation of inferior substitutes; but the producers say that mediocrity and cheapness pay the best, and these are the causes which will prevent many of the art treasures of the present century from occupying that place in the estimation of posterity which from our intelligence and wealth they would otherwise be entitled to claim. We cannot close this short paper without alluding to the fact that Weymouth has some slight associations with the art world. Sir Christopher Wren, whose celebrity as an architect and mathematician is so fully attested by the monuments he has left us, was, in the year 1700, elected one of the parliamentary representatives of this borough; and Sir James Thornhill, the eminent painter, whose daughter married the imitable Hogarth, was born at Weymouth in 1676, and, strange to say, Thornhill was the artist selected to paint the dome of St. Paul's—one of the greatest achievements of Wren's genius, and thus were the two men and Weymouth associated together. The altar-piece in St. Mary's Church was the gift of Sir James Thornhill to the town, and we rejoice to say this admirable work, representing the "Last supper of our Lord," is still in a most excellent state of preservation.

YORKSHIRE ARCHEOLOGICAL ASSOCIATION.

ON Wednesday week the members of the Yorkshire Archæological and Topographical Association visited Leeds, for the purpose of making their annual excursion, and inspecting the ecclesiastical and other antiquities of the town and neighbourhood. In the course of the day about 200 persons attended. The members of the Association assembled in the morning in the Victoria Hall, where they were officially received by the Mayor (Mr. Alderman Barran).

The Mayor, in bidding the Association welcome to the ancient town of Leeds, said that though at the present time the town presented more attractions, perhaps, to the follower of trade and commerce than to the historian and antiquary, yet the past history of the once sovereign state of *Loidis* was to be found amongst the most ancient of our national records. The first charter was granted in 1207, shortly after the erection of the Castle, but the charter under which the Corporation now sat was dated in 1661, and since that year there had been an unbroken succession of mayors. The ancient church, the Castle, the chantries, the bridge chapel, the roadsid crosses, and even the bars of the town, had all been swept away. A few ornamental fragments of stone, gathered from its graveyard, were all that was left to remind them that kings of Saxon and Danish race found a final resting-place within the precincts of its ancient monastery. The extensive ruins of the great Cistercian Abbey of St. Mary, at Kirkstall, alone remained. Faint remains of British and Roman occupations might still be seen in the town.

Colonel BROOKE, in acknowledging on behalf of the Association the cordial welcome accorded by the Mayor, said that one great object of their visits to commercial and manufacturing towns was to show that some of the money that was made there was well expended in the preservation and care of the monuments of the past.

Mr. FAIRLESS BARBER then read a paper entitled "A Few Notes on Leeds Old Bridge," in which he said that the old bridge over the Aire at Leeds, now in course of demolition, tells its own tale, and the most inexperienced observer can see that what until recently appeared to passengers to be but one solid and compact work, has been built at three separate times—is, in fact, three distinct bridges, placed close together side by side. The middle one is the Old Bridge proper; the one on the right hand as you cross from Briggate, is an addition made, as Dr. Whitaker tells us, in 1739; and that on the left is a still later addition, made in 1760. The two latter are plain stone bridges, built of squared ashlar, presenting no special features; but the first, or central bridge, which the other two have hidden and preserved for over a century, deserves more than a passing mention. It is, there can be no doubt, the same structure that existed in Thoresby's time, and which he described as "strong and robust, made of large squared stones." The underside of the bridge is but some 9ft. or 10ft. wide, and the roadway above must have been less than this width by the space which the battlements occupied. Of the five arches, the first nearest Briggate spans the tail-goit of the mill; the next is, and for some time past has been, dry; and the remaining three span the river.

The first or goit-arch is of more ancient construction than the others, and Dr. Whitaker tells us that when the chapel adjoining it was pulled down to make way for the additions of 1760, the foundation-stones appeared so incorporated with those of the bridge itself that both must have been built at the same time. The chapel, which was dedicated to Our Lady, is mentioned in a deed dated as early as 1372; but, as no details have been preserved to indicate the period to which the remains pulled down in 1760 ought to be referred, it cannot be stated with certainty how old this arch is. Its construction is quite Medieval in character. From either pier rise five half chamfered ribs of stone, with intervals of about 12in. each between them, and these bear an arch of two orders, each of which is also chamfered. The remaining four arches of the bridge are also of two orders, with chamfered edges, but have no supporting ribs.

The party next proceeded in conveyances to the interesting Norman church at Adel, where the symbolism of the remarkable sculptures of the edifice was explained by the Rev. George Lewthwaite. The rector, the Rev. E. T. Simpson, afforded the visitors an opportunity of inspecting a large collection of interesting objects found in the neighbourhood.

Kirkstall was next visited, where, luncheon having been served in the grounds of the Abbey, Mr. Edmund Sharpe, M.A., of Lancaster, delivered a lecture on the ruins of the fine Cistercian Monastery. Mr. Sharpe's remarks were illustrated by a valuable series of large drawings of the ground-plans of the most noted Cistercian abbeys in Europe, including those of Tintern, Byland, Roche, Rievaulx, Croxden, Fountains, Furness, and Kirkstall. [It will be remembered that Mr. Sharpe read a paper "On Cistercian Architecture" at the Royal Institute of British Architects a short time ago.] Hand plans of Kirkstall Abbey, and a table of the seven periods of English architecture, had previously been distributed amongst those who took part in the excursion. Mr. Sharpe said he remembered some five-and-twenty years ago being in a committee-room of the House of Commons when the proprietor of those ruins was endeavouring to make out a case against a railway company which had brought a bill into parliament for the construction of one of the railways which had since invaded the valley. He remembered listening for something like an hour and a half to the evidence of a witness who expatiated on the value and importance of Kirkstall Abbey, and was rather curious to hear what the opposing counsel could say in mitigation of the case that had been made out. The counsel for the railway company, he remembered well, got up and asked the witness only one question—"Kirkstall Abbey—is it a ruin?" and then sat down as if he had completely demolished his opponents. It was his (Mr. Sharpe's) business now to prove that the abbey was something more than a ruin. He first referred to the various methods in which such ruins might be viewed, and adopted that which afforded an opportunity of drawing from them an instructive lesson. The Cistercian Reformation of the twelfth century he spoke of as one of the most remarkable movements that ever took place in the history of the Church, and he thought the Reformation of the fifteenth century was in some measure influenced by the action taken by the first Cistercian monks who left the Benedictine Abbey in Burgundy. He described with much minuteness the buildings that were erected by the order, and remarked that Yorkshire contained more Cistercian abbeys than any other county in the kingdom. The rules of the monks, he explained, strongly influenced the arrangements and architecture of their buildings, and these rules he described with considerable detail. In speaking of the arrangements of the Cistercian abbeys he made constant reference to Fountains and other well-known monasteries, and indicated the positions of the church, the cloister-court, the chapter-house, the refectory, the kitchens, the cloisters, the abbot's residence, the hospitium, and the other apartments of a large and complete monastery of this order. He pointed out the position of the various apartments at Kirkstall, spoke of the excellent condition in which the ruins were kept by the lessees, and said that all present ought to be much obliged to them for the care that was taken of the abbey, and for the access that was afforded for inspection by visitors. The abbey, he said, belonged entirely to the very commencement of the Transitional period from 1145 to 1190, having been begun by Henry de Lacy in 1152, and completed in 1165. He spoke of the gatehouse as being most interesting, from being the only example of that period that he knew of. Mr. Sharpe, at the close of his lecture, took the party round the chief portions of the abbey, and pointed out the principal

features of interest. The gatehouse, which forms a portion of the residence of Major Butler, was also visited by the party.

After leaving Kirkstall, the excursionists returned to Leeds and visited St. John's Church, where Mr. J. T. Micklethwaite, of York, read a paper descriptive of the special features of the church, which render it almost unique as a specimen of seventeenth-century architecture. The visit to this church brought to a conclusion one of the pleasantest visits the Association has ever made.

DEATH OF SIR JAMES PENNETHORNE.

WE regret to announce the death of Sir James Pennethorne, who expired at his residence, Worcester Park House, Malden, Surrey, on the 1st instant. Sir James was the son of the late Mr. Thomas Pennethorne, of Worcester, and was born in 1801. During his Continental tour he devoted considerable attention to modern Italian architecture, and on his return he became principal assistant to Mr. Nash, and was entrusted with the Strand improvements, the building of Carlton-house-terrace, the laying out of St. James's Park, and other public works. He was appointed architect and surveyor to the Board of Works and Public Buildings in 1840, and shortly afterwards surveyor of houses in the Office of Woods and Forests, retiring in 1870, with the honour of Knighthood, after thirty years' service. During his professional career, he successfully carried out many important works. In 1838 he submitted to a Select Committee of the House of Commons plans for the improvement of the metropolis, which were approved and adopted in an Act passed in the following year, and commenced by him in 1840, in conjunction with Mr. Chawner. These improvements, costing in the aggregate over a million of money, comprised the formation of the Victoria and Battersea Parks; the new street from Lower Sloane-street to Chelsea-bridge; the alteration of the Quadrant, Regent-street; the Geological Museum, in Piccadilly; the additions to the Ordnance Office, Pall Mall; the New Record Office, Fetter-lane; the new Stationery Office, Westminster; the new west wing of Somerset House; the Offices for the Duchy of Cornwall; the south wing of Buckingham Palace; and the University of London, Burlington-gardens. Among his private works are the Bazaar, St. James's-street; Christ Church, Albany-street; Trinity Church, Gray's-Inn-road; the enlargement of Lamorby House, for J. Malcolm, Esq.; Swithland Hall, Leicestershire; Dillington House, Ilminster; St. Julien's, for the Right Hon. J. C. Herries; and house at Newmarket, for W. Crockford, Esq.

Sir James Pennethorne's design for the Royal Exchange was one of the five selected. He was an honorary member of St. Luke's Academy, Rome, and of the Society of Architecture, Amsterdam. He received the gold medal of the Institute in 1857, and was created a Knight, as mentioned above, on his retirement in 1870.

COST OF THE MONT CENIS TUNNEL.

THE total cost of the Mont Cenis Tunnel (to be opened out the 17th inst.) amounts to 65,000,000*l.* Of this amount 20,000,000*l.* are to be contributed by the Victor Emmanuel Railway, or Railway of Northern Italy. This sum is to be paid on or before the opening of the tunnel. The French Government was to pay 19,000,000*l.* if the work was accomplished within twenty years, reckoning from 1862. But if the work was accomplished at an earlier date, France bound herself to pay 500,000*l.* more for every year gained upon the stipulated time. As there have been eleven years thus gained, France will have to pay 5,500,000*l.* besides the 20,000,000*l.* of the original stipulation. She has besides to pay 5 per cent. interest on the money due for the work as it proceeded from year to year. Thus the charge borne by Italy in this enterprise will be something less than 20,000,000*l.*, an advantage fairly gained by her diligence in carrying on the work, a diligence stimulated by the very conditions of the contract. It must be observed that had the construction of the tunnel continued beyond the stipulated term of 20 years, it was Italy that would have lost 500,000*l.* for every year in excess of that period. There was a time in which the hard quartz, with which the excavators fell in on the side of Modane, rendered it extremely difficult to foretell how long it might be before the tunnel could be terminated. Fortunately the quartz stratum was only 380 metres thick, and no very serious resistance was met elsewhere. The masonry of the tunnel is excellent throughout. No inconvenience whatever from smoke, steam, or mephitic air is apprehended.

CHURCH OF S. BARTHOLOMEW, ARMLEY.

OUR illustration this week is the chosen design for the rebuilding of a church in one of the suburbs of Leeds, recently submitted to limited competition. It will be seen that the church is cruciform, with a central tower surmounted by a saddle back roof and terminal cross. The eastern arm of the cross is apsidal, and has been devoted to the sanctuary, whilst the choir are provided for in stalls under the tower, and the organ is intended to be placed in one of the transepts, which will serve also as a choir vestry. The nave is of such dimensions as will accommodate an ordinary congregation without resort to aisles or transept, and, indeed, the nave only is intended to be permanently seated, although extra accommodation can at any time be obtained by the use of chairs. The church will seat altogether about 900 persons, and is intended to be built of local sandstone, faced internally with limestone from the Aneaster quarries. Messrs. Henry Walker and Joseph Athron, of Leeds, are joint architects.

THE PROPOSED CANAL BETWEEN THE NORTH SEA AND THE BALTIC.

THE Berlin correspondent of the *Standard* writes:—"A great deal has lately been written about the proposed canal between the North Sea and the Baltic, and both the expense and the importance of the natural obstacles in the way of the realisation of the project have been greatly exaggerated. The only elevation which would render a deep cutting or a lock necessary is from $2\frac{1}{2}$ to $3\frac{1}{2}$ German miles in breadth, and not more than 67½ ft. in height, and this can hardly be called a difficulty, as the soil is easily worked. The first estimate, 28,192,000 thalers, may have been too low, and it is known that the Prussian Minister of Commerce from the first contemplated the necessity of employing a much larger sum, but, all things considered, it is highly improbable that 6,000,000 more will be required. The breadth of the canal at the surface of the water is to be 226 ft., and at the bottom 76 ft.; its depth 31 ft. This would afford ample space for four vessels to pass each other, two of which might be large men-of-war. The length of the longest proposed line is 14 German miles, that of the shortest $11\frac{1}{2}$ German miles. The choice of the line to be adopted is the most difficult question that still remains unsettled, as every district in the Elbe Duchies wishes a share in the immediate benefits of the undertaking, and consequently exaggerates the obstacles in the way of other plans, and enhances the advantages of the project most favourable to itself. Besides this, it is desirable to unite, as far as possible, the interests of the merchant shipping with those of the navy. To meet the wishes of both parties it would be necessary to construct various branch canals, which would involve an additional outlay of from 10,000,000 to 15,000,000 thalers. The results of the experience gained in the late war render it almost certain that the port of Kiel will be chosen for the one end of the canal, the mouth of the Elbe for the other. It is highly probable that this and all other questions will now shortly be decided, and the work commenced."

WALKER'S FIRE-PROOF FLOORING.

A LIGHT and otherwise advantageous system of fire-proof flooring has recently been invented by Mr. John Walker, of 12, James-street, City-road. The main girders are formed of balks of timber which have been rendered unflammable, and which are encased in four Z irons, the flanges of which serve to carry the joists. These latter are also of timber, rendered fire-proof and sandwiched between two deep L irons. They are placed from 12 to 18 inches apart, and on the flanges of the L irons rest tiles 12 or 18 inches square, and formed with a fillet on the under edge. Upon the tiling is laid concrete or cement an inch or so in thickness, and the body of the flooring is complete. By this arrangement the floor boards are readily fixed down to the timber of the joists by nails, and the laths of the ceiling beneath are also easily nailed to the underside of the same member. The fillet on the edge of the tile allows a space between its face and the lathing, and so enables the proper keying of the plaster. The advantages of this system have, we understand, led to its adoption by a company which has just been formed in Paris for rebuilding a thousand houses in that desolated city. We hope it may be long before we have a practical test of the value of the system, but if the wood be properly treated, there is no reason why it should not come into general use and supersede in many instances the heavier systems.

PROPOSED SANITARY EXHIBITION AT LEEDS.

THE Social Science Association have determined, at the request of many persons interested in sanitary reform, to hold an exhibition of sanitary appliances at their forthcoming annual Congress, which is to be held at Leeds from the 4th to the 11th of October next. Among the articles which it is intended to receive are filters, water fittings, taps, stand pipes and pumps, closet apparatus, models and plans of improved workmen's dwellings, public baths and washhouses, gymnasiums, cottage and temporary hospitals, illustrations of various disinfecting processes, hospital ambulances, illustrations of drainage, farm and sewage irrigation works, specimens of preserved meats and other dietetic articles, improved cooking apparatus, warming and ventilating apparatus, &c. The exhibition is intended to bring under the notice of health officers and the many men interested and experienced in sanitary questions in various parts of the kingdom, who usually attend the Congress, the latest appliances of science having for their object the improvement of the public health, and will probably form a useful as well as an attractive feature of the meeting. Every information may be obtained on application to Dr. Robinson, hon. sec. of the Health department, Social Science Offices, Leeds.

MR. RUSKIN ON ART TEACHING.

IN the current number of *Fors Clavigera*, Mr. Ruskin, in describing the new endowment he has in hand, and also the progress of his land scheme—the "S. George's Fund"—says:—"What, for my own part, I am about to endeavour is certainly within my power, if my life and health last a few years more, and the compass of it is soon definable. First, as I told you at the beginning of these letters, I must do my own proper work as well as I can, nothing else must come in the way of that; and for some time to come it will be heavy, because, after carefully considering the operation of the Kensington system of art teaching throughout the country, and watching for two years its effect on various classes of students at Oxford, I became finally convinced that it fell short of its objects in more than one vital particular; and I have, therefore, obtained permission to found a separate mastership of drawing in connection with the art professorship of Oxford; and elementary schools will be opened in the University galleries, next October, in which the methods of teaching will be calculated to meet the requirements which have not been contemplated in the Kensington system. But how far what these, not new, but very ancient, disciplines teach, may be by modern students, either required or endured, remains to be seen. The organisation of the system of teaching, and preparation of examples, in this school, is, however, at present my chief work—no light one—and everything else must be subordinate to it. But in my first series of lectures at Oxford I stated, and cannot too often or too firmly state, that no great arts were practicable by any people, unless they were living contented lives, in pure air, out of the way of unsightly objects and emancipated from unnecessary mechanical occupation. It is simply one part of the practical work I have to do in art teaching, to bring, somewhere, such conditions into existence, and to show the working of them. I know also assuredly that the conditions necessary for the arts of men are the best for their souls and bodies; and knowing this, I do not doubt but that it may be with due pains, to some material extent, convincingly shown; and I am now ready to receive help, little or much, from any one who cares to forward the showing of it. Sir Thomas Dyke Acland and the Right Hon. William Cowper-Temple have consented to be the trustees of the fund; it being distinctly understood that in that office they accept no responsibility for the conduct of the scheme, and refrain from expressing any opinion of its principles. They simply undertake the charge of the money and land given to the S. George's Fund; certify to the public that it is spent, or treated, for the purposes of that fund, in the manner stated in my accounts of it; and in the event of my death, hold it for such fulfilment of its purposes as they may then find possible. But it is evidently necessary for the right working of the scheme that the trustees should not, except only in that office, be at present concerned with or involved in it; and that no ambiguous responsibility should fall on them. I know too much of the manner of law to hope that I can get the arrangement put into proper form before the end of the year; but I hope, at latest, on the eve of Christmas-day (the day I named first) to publish the December number of *Fors* with the legal terms all clear; until then, whatever sums or land I

may receive will be simply paid to the trustees, or secured in their name, for the S. George's Fund; what I may attempt afterwards will be in any case scarcely noticeable for some time; for I shall only work with the interest of the fund, and as I have strength and leisure. I have little enough of the one; and am likely to have little of the other, for years to come, if these drawing schools become useful, as I hope. But what I may do for myself is of small consequence. Long before I can come to any convincing result, I believe some of the gentlemen of England will have taken up the matter, and seen that, for their own sake, no less than the country's, they must now live on their estates, not in shooting time only, but all the year; and be themselves farmers, or 'shepherd lords,' and make the field gain on the street, not the street on the field; and bid the light break into the smoke clouds, and bear in their hands, up to those loathsome city walls, the gifts of Giotto's charity—corn and flowers. In a note, Mr. Ruskin says:—"Since last *Fors* was published, I have sold some more property, which has brought me in another ten thousand to tithe; so that I have bought a second thousand Consols in the names of the trustees—and have received a pretty little gift of seven acres of woodland, in Worcestershire, for you, already—so you see there is at least a beginning."

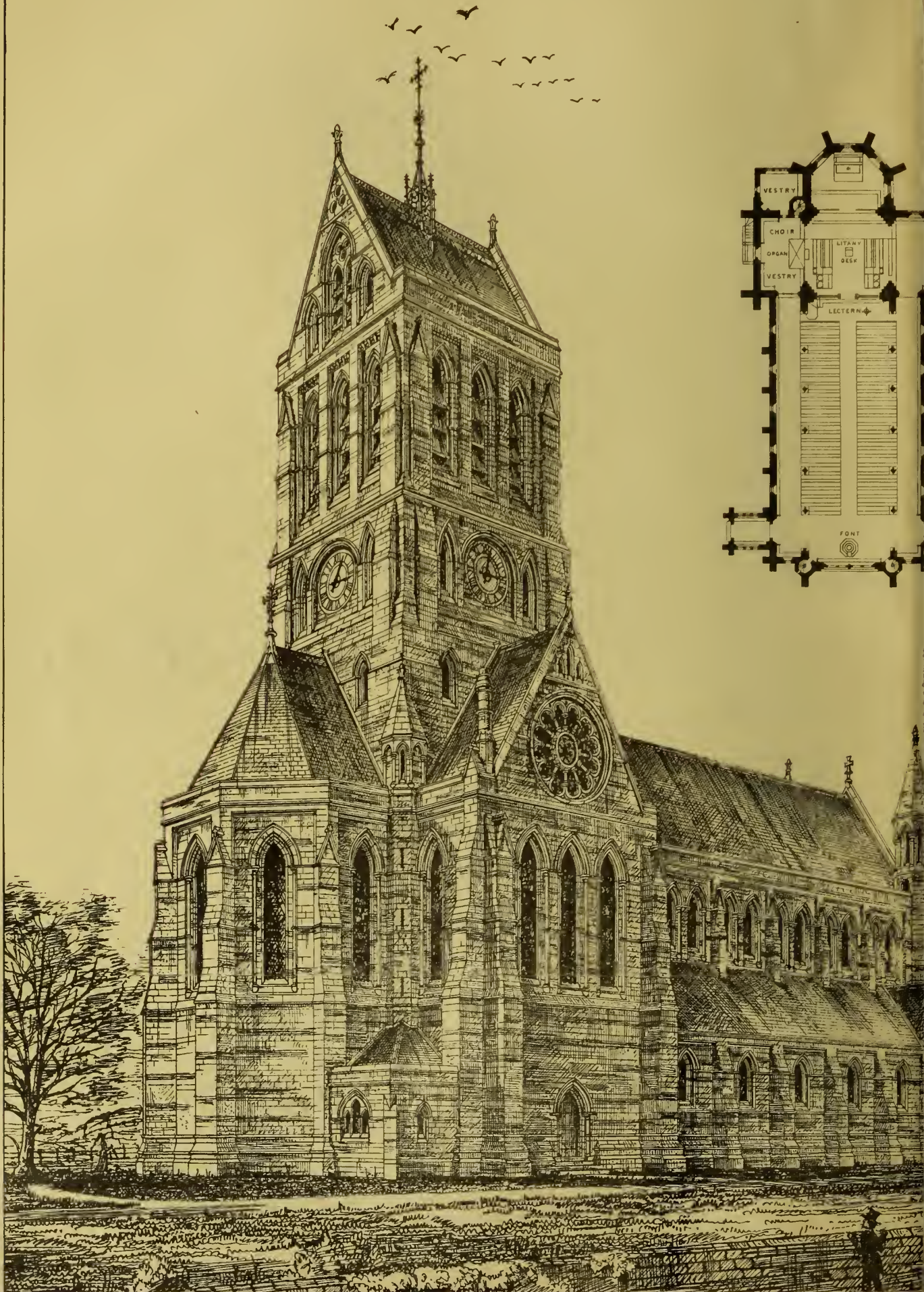
HOSPITALS FOR SMALL TOWNS AND VILLAGES.

THE following remarks appear in a recent Privy Council Minute on hospitals for infectious diseases:—"Hospital accommodation for infectious diseases in towns is wanted more constantly, as well as in larger amount, than in villages; and in towns there is greater probability that room will be wanted at the same time for two or more infectious diseases which ought not to be treated in the same ward. The permanent provision to be made in a town, in order to obtain reasonable security against the spread of infectious diseases, should consist of not less than four rooms, in two separated pairs, each pair to receive the sufferer from one infectious disease, the men and women, of course, separately. The number of permanent beds to be supplied must depend upon various circumstances, chiefly upon the size of the town; but, as no reasonable amount of permanent accommodation could be trusted always to supply the requirements of a place when infectious disease has actually become epidemic, foresight must in the first instance be used, how, in emergency, additional accommodation can be temporarily given to meet requirements in excess of the permanent provision; otherwise, the authorities may unexpectedly find themselves obliged to leave ill lodged infectious cases at their homes, much as it no hospital had been provided. Accordingly, for town of any importance, the hospital provision ought to consist of a permanent building, having around it space enough for the erection of temporary structures as occasion may require. Considerations of ultimate economy make it wise to have the permanent building equal to somewhat more than the average necessities of the place, so that recourse to temporary extension may less often be wanted. In small towns, for instance, if a hospital consisting of four wards and the necessary administrative offices is to be provided, the original expense of making each ward serve for (say) eight persons, will be far less than double that of making the ward for four. And in any case, it is well to make the administrative offices somewhat in excess of the wants of the permanent wards; because thus, a little additional first cost, they will be ready to serve when occasion comes, for the wants of the temporary extension, and so save great inconvenience and outlay. In huts, as in permanent buildings for the treatment of infectious diseases, not less than 2,000 ft. cubic space, with 144 square feet of floor should be given to each patient. The ventilation of huts, also, is of equal importance with that of permanent hospital buildings. It is best secured by the combination of side windows with roof openings, the latter protected from rain, and running the whole length of the ridge of the roof."

ANNUAL MEETING OF YORKSHIRE BUILDERS.—On Wednesday week the annual meeting of the builders of Yorkshire was held at the Nag's Head, Leeds, Mr. Woolley in the chair. The officers for the ensuing year were appointed. It was determined to consolidate the Yorkshire Association, and make it more than ever useful in promoting amicable relations between employers and their men. It was found that the ability shown by the House of Lords dealing with the Trades Union Bill, and the adoption of their amendment by the House of Commons, calculated to be of great use in the case of strikes.

CH. OF S. BARTHOLOMEW, ARMLEY.

HENRY WALKER, } ARCHITECTS.
JOSEPH ATHRON, }





REPORT ON THE PRESENT STATE OF DESIGN, AS SEEN IN THE MANUFACTURES IN THE INTERNATIONAL EXHIBITION OF 1871.*

By RICHARD REDGRAVE, ESQ., R.A.

ON the first International Exhibition of 1851, and on the recurrence of such exhibitions, both here and in France, I was called on to report on "Design Applied to Manufactures." On this occasion I am again requested to undertake the task. It is to be expected that this report, ranging as it does over the same field, will repeat matter contained in those already alluded to; and of necessity, since principles of taste, derived from the study of the best works of the past, cannot be changed either in favour of fashion or prejudice.

There has been of late a renewed controversy on the subject of "Principles of Design;" to the necessity of such principles I have long ago committed myself,† and in my reports of 1851, and more especially of 1855, many of these have been formulated. There is danger, however, in enforcing principles too rigidly or too dogmatically; they should be our guides, not our masters; our go-cart in youth, to be laid aside as soon as we have strength to walk in our own path. Rules can never trammel true genius, which soars away to make new precedents; yet even genius, however errant at times, recurs to the normal and central truth; while it is the misfortune of dulness to deride, as contrary to rule, excellence, which it has not the wit to achieve for itself. It has already been said that what are called principles are merely those facts in nature, or in its application to the arts of design, which are to be found underlying the best works of the greatest masters; and as, on the one hand, he snrly would be thought foolish who, casting aside all precept and all tradition, should begin his art for himself, so, on the other, would be the designer who copied only the works of others, without endeavouring to enter into the principles on which they were produced.

From the serial arrangement of these International Exhibitions, the present report does not take so extended a range as former ones, the collection this year consisting of woollen fabrics and pottery only. The design applied to these manufactures will, therefore, principally engage our attention; with, however, a few references to manufactures in other sections, which, having been admitted rather as objects of art than of manufacture, should not pass unnoticed, since the principles of design relating to them are general in their application.

In the Report on Design (1855, p. 35, section 113) it is remarked, with reference to carpets, that "The utility of such works would suggest their being quiet and unobtrusive in their general decoration, even if rich and full of colour. All violent and startling contrasts, either of form or colour, which would draw the eye to them, should be avoided; and pictorial imitation would seem the more out of place the more excellent it is, in a work to be trodden under foot and intended rather to support the general effect and richness of the apartment than to command attention for itself." And again, "flat treatment should be observed for that which covers the ground we tread on." Such were the principles enunciated in presence of the works of some of the greatest designers of France, executed in the richest materials by some of the greatest French manufacturers, and there seems to be no reason to alter them on the present occasion. Indeed, notwithstanding the controversy that has taken place on the subject of these rules, it is most satisfactory to find how gradually they have been accepted and how extensively they have been adopted in the manufactures exhibited on this occasion. While most of the carpets are, as a whole, in good taste, there is, at present, on the walls of the Exhibition hardly one which can be called absolutely vicious in design; indeed, in many the faults arise from too great subservience to these laws; to want of piquancy, from want of contrast, and from too subdued colour, rather than to their excess, the quiet and repose having in some instances been obtained at too great a sacrifice of contrast. Without at all wishing to uphold Indian treatments as the only desirable ones for these fabrics, it is certain that in most of the Indian carpets exhibited there is an instinctive sense of propriety and attention to good principles. Examine No. 6131, a Madras carpet, exhibited by Vincent Robinson & Co. First, it is to be noted how good the proportion is between the carpet and the width of its border. In most of the British

carpets designed on like flat principles the borders are too narrow for the body of the carpet. Then, again, in a well-designed carpet, there should be contrast between the centre of the carpet and its border; a rule little observed in those of English design. In No. 6131 this contrast is obtained, not only by a border darker than the body of the carpet, but also by ornamental details, smaller and more closely treated and with greater fullness of colour than the design of their central portion. Such a treatment may be reversed, and the details of the centre be smaller than those of the body, and its colour lighter, or variety may be obtained by other methods; but when there is no such contrast (as in the Wilton carpet, 6141, exhibited by Crossley & Sons, otherwise a well-designed work, with a suitable proportion of border), the result is indistinctness and want of piquancy. It is worth while, before passing from the front of the carpet 6131, to examine the beautiful sobriety of its colouring; reddish, bluish, greenish tones of colour are used—not red, blue, and green, which it seems the sole effort of some manufacturers to obtain. The very ground of the centre, of unbleached rather than of bleached wool, delights the eye of the painter; the ornamental details, flowing agreeably over the surface and every now and then gathered into a geometrical form—geometrical, yet not too strict and rigid, serving to give largeness to the design, at the same time that the colour is thoroughly dispersed—are lessons to be noted, showing sobriety combined with cheerfulness, and warning us against too rigid an adherence to the rule of subdued ornamentation.

Of carpets designed in other styles than those wholly on flat principles or derived from India or Persia, there are at present few. There may be others when the French goods are exhibited, as it is mostly from that school that the florid and picturesque treatments arise. The only specimen of a Louis Quinze carpet is 6158, exhibited by James Templeman & Co.; yet even this is so pervaded by the new taste that the vices of the style are subdued, and the result is a pleasant breadth of colour, and absence of naturalism in the details.

One of the most ambitious designs in this section is that carried out in 6151, an Axminster carpet, exhibited by Turberville, Smith & Sons. Though the details of the ornamentation are clever, the design, as a whole, cannot be considered successful. It is too pronounced, and yet too intricate; thus it is difficult to define what is the general colour of the ground of the carpet and of its inner border, or to trace the main geometrical constructive forms in their intersection with one another and with the inner border. These geometrical constructive forms inclose a white ground in the centre of the carpet, and certain large spaces filled with a white ground occur also in the inner border; but, from the want of coherency alluded to, they appear as unconnected patches in no apparent relation to the white centre: thus, as a whole, the design is confused and fragmentary. Had the green foliage and its ground been carried throughout the inner border, instead of introducing the white spaces, the effect would have been far more satisfactory.

There are a few carpets exhibited which, from the rigidity of the main lines of the ornamentation and the smallness of the details of the filling, have the appearance of floor-cloth; a great fault in such fabrics, as suggesting a meaner rather than a richer material. No. 6145, though the work of one of our eminent designers, is faulty in this respect.

In the same gallery with the carpets is the collection of the pottery of all nations. The pottery which principally embodies design may be classed as—

- Tiles for floors and walls and architectural pottery generally.
- Domestic utensils.
- Ornaments.

It is obvious that many of the laws which should govern designs for carpets are equally applicable to floor tiles. Thus all forms which, either separately or by combination, give the appearance of inequality of surface, are even more objectionable when introduced into tiled floors than in carpets, from our sense of the greater rigidity and hardness of the material. Again, patterns that are extremely pronounced or contrasting are objectionable in both materials. The best taste seems to be to cover the general surface of the floor with tiles whose ground is a simple colour; or, if of varied colours, they should be non-contrasting as to light and dark, to give repose. These masses may be occasionally varied with grouped patterns, and have ornamented borders. The attempt to make each tile a decorative unit, and to multiply it over the whole floor, is rarely satisfactory, however it may be sanctioned by old precedents. Forms of this kind, recurring over large spaces, are likely to prove very tedious to the

eye. After all, much depends on the architectural combinations designed by the architect for laying out the whole floor, since tiles, simple in themselves, may be combined so as to have due quiet and repose, or to show all the faults arising from over-contrast either of form or of colour. It is to be remembered, also, that the decoration of the floor must depend upon the use of the apartment. Large, and somewhat empty, entrance-halls call for more pronounced treatments; aspect and use also must determine whether the floor should be cool or warm in its colouring, light or dark in its tones; and the numerous works exhibited by the great tile makers, both of single tiles and of well-designed borders, suffice to give ample scope to the architect to group and combine them in good taste. The decoration of these goods has greatly advanced in fancy and variety within a few years; and many of the borders are flat in treatment, and in good taste.

The treatment best adapted for wall tiles differs, in some respects, from that best suited to floor tiles. The specimens exhibited in this class are very numerous, though in some cases they seem very unsuited to their purpose. The design of each unit tile may in itself be satisfactory, yet, as has been said, in their combination, the constant recurrence of some too-prominent form of ornament is likely to prove disagreeable. It is even more likely to do so on walls than on floors. On walls breadth and quiet (either arising out of the suppression of violent contrasts of light and dark, or of forms which are too rigid, and do not flow into one another) must be more desirable than even in the decoration of floors. A strong expression of lines, arising from the recurrence of ill-designed tiles, is always objectionable, the more so if they tend too obviously in a horizontal direction; this lowers the apparent height of low rooms. Strongly expressed diagonals are almost equally unpleasant—diagonals tending only in one direction more particularly so. There is, in many respects, a cleverly-designed English tile in Messrs. Minton's collection, ornamented with a branch of orange blossoms. It is, however, spoiled by the introduction of large masses of blue in circles on the white ground, while the foliage, which crosses both white and blue, repeats, and would form a line across the room at an angle of 45°, with the floor in one direction only. Covering a wall with such a pattern must make the objects in the hall or room appear out of the upright, while the blue bull's-eyes would, to most people, be intolerable. As in floor tiles, so in those for walls, it seems preferable to use those which show their natural ground, whether white, red, green, or tinted. Some of Maw's tiles, exhibited by Simpson & Son (No. 7 in their list), and forming part of a reredos, with delicate linear ornamental forms, on the natural red ground, are good examples; the rather objectionable combination of square and round forms in the lines of their decoration, being hidden by the ground, is almost overcome. There are many tiles, exhibited both by Minton & Co. and Minton, Hollins, & Co., derived from Persian examples; some are open to the above objections, but generally they are designed on sound principles; in them the pure ground of the material is preserved, and the recurrence of the pattern, necessarily arising from the repeats of the tiles, is so skillfully managed by the flow of the ornamental lines, that the eye is led over the whole wall. The luminous colour and graceful form of the ornament remove the sense of the tedious repetition of numerous small pieces. The best of these tiles ought to be carefully studied, not with the object of the mere reproduction of Persian designs, but to arrive at the principles of the original designer. The combinations of form and colour they display (although in the reproductions of our tile-makers some of the fineness of the originals is lost) are delightful to the eye; and while it may be said that they are more suited, from their lightness, for a hotter climate than for our own, by using different tints for the body of the tile, greater fullness may be obtained, without falling into the papier-mâché or jappanned-ware surface which is so objectionable in many of the tiles exhibited. Some of the tiles manufactured by Maw & Co., and exhibited by Simpson & Son, have much merit in their design. The rosette pattern (consecutive No. 7), consisting of small rosettes in low relief, and with broken tints of colour, has a rich and quiet textural surface, hiding the recurrence of the pattern with good effect. The same, also, may be remarked of the borders (consecutive No. 12), which are in good taste, and, from the treatment of the colour, would not have too strong expression when on the wall. The opposite is the case with the tiles filling in the mantel-piece exhibited by this firm, the clever design, it is said, of Mr. J. Lonsdale. The strong contrast of the blue ornament with the white ground of these tiles

* From the Official Report, Fine Arts Division, Part IV. Published by J. M. Johnson & Sons.

† "The Necessity of Principles in Teaching Design." Chapman & Hall, 1853.

would quite over-crow the objects of *virtu* the shelves are meant to accommodate. The tiles for their other mantel-piece, embodying the sentiment of "Welcome is the best dish," are more quiet and in better taste. Many of the objects exhibited by this firm, and manufactured by Maw & Co., deserve attention; they are the work of Mr. Elden, and it were to be wished that in all cases the talents of designers had had more complete recognition in this exhibition than has been accorded to them. This recognition of talent is wanted to secure the interest of the artist in his work, and when given it will benefit both him and the manufacturer. The absence of the names of artists who have aided in the production of works is the more to be regretted on this occasion, since there seems to be a growing inclination among men of high rank in their profession to aid our manufacturers, and to take a part in decorative art. The liberal way in which the wishes of the authorities at South Kensington have been responded to by artists, and the important works that are resulting from their assistance, are instances; as are also many objects in the Exhibition itself. Manufacturers, when they obtain the help of high professional talent, are only too anxious to make it known; but artists who have not yet obtained public repute have their claims postponed in favour of the manufacturer, or even of the mere tradesman.

A tile painting of an Apostle, with a background of gold mosaic, exhibited by Simpson & Son, is designed in good style; but it is doubtful if the combination of tiles, as a surface for the painter's art, can compete eventually with the new method of painting on hexagonal tesserae, the invention of Messrs. Minton & Co., and of which there is a specimen (a Falconer, painted by H. S. Marks, A.R.A.) in the Towers of the British Gallery appropriated to fine art.

It is hardly possible to estimate the proper application of design to the great body of works exhibited in this class, since they should be judged of almost wholly in relation to the structures of which they are to form a part. Their design is essentially but a detail of the whole idea of the architect; and to examine merely a baluster, a medallion, a patera, or a portion of a string-course is, in a lesser degree, to take a single brick as a specimen of the house. Thus the portion of the terra-cotta cornice of the "Wedgwood Testimonial" has its value as a work of art only in relation to the whole building; and even the rich and fanciful columns by the late Mr. Godfrey Sykes, though the large style in which they are treated may be admired, can only be properly judged of in their place as a part of the architectural design of the South Kensington Museum. If this is the case in works designed for a special position, what consideration can be given to key-stones, string-courses, balusters, pateras, brackets, vases, medallions, and shop properties of every description prepared for the building trade, to be inserted at pleasure in structures of any or of no style, to add to their pretentious character? Such can only have a place in a report on the material, on its colour, hardness, durability, &c. This classification allowed, there are few objects claiming a separate notice, and none which call for any praise. The constructive forms of many of the works exhibited are, it is true, to be traced back to the antique, but so vulgarised in proportion, and in their curves, as to be wholly spoilt. Then the ornamentation of these forms is, as a rule, redundant; the material is so pliant under the hands of the modeller, lends itself so readily to ornament, admits so easily of additional details, that, unless in the hands of a true artist, over-ornamentation is sure to result. The "Amazon Vase," whatever may be its merits as a *tour de force* of manufacture, is a good example of this, and shows what should be avoided rather than as a work of art. Other vases, fountains, &c., are, as to taste, on a par with the positions they are likely to occupy in the villas and mansions of our suburban districts. This beautiful material, however, is coming into favour with our architects, and there are many signs in the buildings in progress in various parts of the metropolis that its proper treatment as a material for ornamentation is becoming appreciated by them.

In examining domestic utensils fashioned by the hands of the potter, it is remarkable how persistent, in the different countries, are the forms of such utensils; how, indeed, the household vessels of remote ages continue, in the same localities, to be produced even to our own times; more especially in those countries where civilisation is imperfect, or a rude state of society is slowly yielding to a more advanced one. Even provincial peculiarities as to material, shape, colour, and other decoration, cling to localities despite the novelties that extended trade and commerce tend to introduce. Exclamations as

to want of novelty are at times heard from the visitors to this section of the Exhibition, even in the face of the most extreme efforts after novelty; but, in objects of domestic utility, in what is novelty to be sought? There are but few simple solids of capacity; these we may combine, alter as to proportion, refine, or the reverse, or vary by stems or handles. Even here we are confined within still narrower limits, when utility has to be largely considered, and capacity for containing or discharging the contents, solid or liquid, for cleansing, portability, &c., form part of the problem; and when constant use has made the consumers well-informed in these respects, then we become aware that variety in this class of objects is mostly to be sought in the surface decoration of certain established forms, and novelty less to be expected than in those works it has been thought well to describe as "ornaments." There the designer, the modeller, and the painter may lavish their art, unrestrained by any utility or any rules but those which govern the best use of the means or material on which they expend their skill. And, in this view, great toleration should be given to over-extravagant fancies and efforts, since, on objects classed as ornaments, unrestrained art, lavish decoration, and new materials are first tried, to be applied in due time to domestic utensils, under the restrictive rules for their production which are such curbs on the invention of the designer.

When the attempt to produce the porcelain of the East was, at the beginning of the last century, crowned with success, and the Duke of Saxony founded the manufactory at Dresden, the hard, semi-translucent body, the forms and colours of Chinese porcelain, were the objects of the manufacturer's ambition. France, entering into the contest later in the century, and disappointed in achieving the hard paste of the East, invented the *pâte tendre*, which so readily lends itself to surface-decoration. The skill of the French chemists was engaged on the invention of new fluxes and new pigments. The best artists of France designed new forms, and the painters vied in decorating their surfaces: indeed, the style produced may be called a painter's style. Thus, the porcelain of the manufactory at Sèvres obtained a reputation that has never been equalled; and some of the choicest attempts of our own manufacturers are still devoted to the reproduction, either directly, or with varied treatments, of the fine works of the golden age of that celebrated manufactory. Hence perfection of material execution has resulted rather than novelty.

Again, at the latter end of the last century one of our English potters, Wedgwood, wisely and unreservedly seeking the aid of one of our English artists, produced a style as novel in its kind as that of Sèvres. Based more directly on the art of Greece and Etruria, it has yet its own distinctive character; it is marked by the impress of sculpture rather than of painting, and, during three-quarters of a century has continued a favourite with the world. Instances of such marked class novelty are hardly to be expected to arise even from international exhibitions; but, with novelty in the treatment of individual objects, with novelty of effort, and certainly with restrained taste, the Exhibition abounds, as also with novelty of material, such as that somewhat improperly called "permanent fresco" of Minton, Campbell, & Co., and the painting, with coloured slip or clay, by the same firm, &c. These, however, do not enter into the scope of this report. Perhaps, among the domestic pottery of the Exhibition, the most distinctive novelty, as a whole, is the earthenware dinner-service and other utensils exhibited by Messrs. Wedgwood, in which simple, and by no means novel forms, in a cream-coloured body, edged with a narrow yellow margin, are decorated with subjects slightly and sketchily painted by Lessore. There is a freshness about the very simplicity of the ground and its decoration that excites our pleasure—the more, perhaps, from the proximity of the highly-ornamented and skilfully-decorated works which are in its neighbourhood.

When the pottery coming under the previous heads has been reviewed, there still remains a large class of objects which we can only designate as ornaments. What principles of design can be applied to them, or by what rules shall we criticise them? It cannot be said that "Utility should be considered before ornamentation," for real utility they have none. It is true that many of the objects thus grouped may take the form of vases, ewer-garnes, candelabra, fountains, pilgrim bottles, &c., yet they never pretend to serve such purposes, but are merely decorative ornaments. Indeed, judging from the general aspect of such works, it would seem that the more fantastic, rococo, and picturesque the work, the more, with some persons, it seems an object of admiration. It is possible to judge of an imitative fish in an imitative basket, by its truth of imitation;

but, at the best, even with the precedent of Palissy ware, it is low art; and, why such imitation at all, since, after the first wonderment is over, it will but cumber the side-table or the cabinet? The old Palissy and majolica ware were intended, in the absence of silver or gold plate, to furnish the buffets of those days, and give sparkle and colour in the apartment; and there may be a degree of pleasurable use in the same class of ornaments for the same purpose on mantel-pieces and shelves in our own; some may even hold flowers, or the trifles of the boudoir or dressing-table, and some may give richness to our dinner-tables; thus works in this class may, perhaps, be left to their fantastic originality. A vast amount of good art is, however, expended upon these ornamental objects; it is on such the artist is more peculiarly engaged, rather than on pottery for domestic use; and some suggestions may well form a part of this report, to prevent, if possible, art being improvidently employed, or in a manner likely to defeat itself.

And first it would appear that china and even faience and stoneware, are so beautiful in their material, or what is called the body of the ware, that it seems wrong wholly to obscure that body—to metalise it by too much gilding, to render it into an imitative *cloisonné* enamel, to give it the appearance of hardware, of papier-mâché, or anything but what it really is. This seems to hold good even in our modern majolica, which when wholly covered with paint has less beauty of appearance than when the natural colour of the body pervades some surface of the work. As an example, the large vases exhibited by Prussia suffer from this defect; had some part of the natural surface of the material been left, the contrast would have been agreeable, the colouring have seemed richer, and the vases have looked less like papier-mâché, or Vernis-Martin. Not only is it objectionable wholly to hide the surface of pottery, but the attempt to imitate other materials is rarely satisfactory; thus the beautiful dark enamelled pottery from Worcester suffers from our comparing it with metal enamel-work of the sixteenth century. The same may be said of various very fine works exhibited by Minton & Co., who have made great efforts—and in most instances successful efforts—in so many departments of the potter's art in this Exhibition. Thus the beautifully-manufactured vase (No. 242 in their list), and another (No. 13) by the same firm, the one imitative of *cloisonné* enamel, the other ornamented with bands of imitative damascened ornament, although great efforts of manufacturing skill, are examples of mis-applied decoration, and cannot compete with the rich quality of surface of Chinese *cloisonné* or the inlays of India, Milan, Liège, or Spain. In the fine vases of the best time of Sèvres, the *bleu du Roi*, the *rose du Barry*, and other exquisite surface-colours, rarely cover the whole object, but leave the ground of the *pâte* exposed in various parts, on which the painter has exercised his skill in floral, landscape, or figure decoration. This rule of not concealing the true material, holds good also as to the gilding of china, both of the principal form and of the accessory parts, handles, knobs, &c., which should not be treated so as to look like gold mounts, but the gold so added as to be evidently an enrichment of the pottery; too much gold is particularly offensive, giving a heavy, clumsy look; this is shown in the Russian vase, No. 4072, also in some of the pieces from Worcester, where the handles and knobs appear like ormolu mounts; also in the handles, bands, and cover—the raised ornament of a fine vase exhibited by Messrs. Copeland. The handles have the heavy look of ormolu, and appear as accessories attached to, rather than formed out of the materials of the vase itself, besides interfering with the delicate painting of the flowers on the body of the vase. The pleasure arising from the material is shown in our delight in white china, or in the most simple mode of its decoration. Thus, in Nankin porcelain, with its blue ornament; in Satsuma ware, or even our own fine stone-ware, of which some pieces of great beauty as to body or material are exhibited by Doulton & Co. This remark is not intended to impugn the use of coloured body, as in Wedgwood ware, or even that of French celadon, but refers to the error of imitating another material in porcelain or earthenware.

Having reported so far on design applied to woollen goods and pottery, the classes more particularly set forth for this year's Exhibition, it only remains to notice some of the miscellaneous works admitted to the Fine Art Galleries from their more intimate relation to art. In many classes of manufactures these works are so few in number and so difficult to group together, that design in relation to them may be passed over until the classes in which

they are comprehended form a part of the Exhibition of the year. The larger number, however, of such miscellaneous works come under the head of furniture, and call for consideration in this report. It was laid down in the report on the Paris Exhibition of 1855, p. 14, that "the primary elements of style are constructive, and that the design of a work must have regard to construction, and consequently, to proper use of materials prior to the consideration of its ornamental decoration; and that "as construction necessarily implies a purpose, utility must have precedence of decoration."

In few of the costly pieces then exhibited had these rules been observed. They were mostly designed as ornamental objects, their use being little regarded. But since that period, and in the present Exhibition, a change is evident; partly from the enunciation of these laws, and still more from a reviving taste among our architects and designers for the more simple Mediaeval styles. The works now under review may be fairly divided into two classes. First, that wherein utility is the primary motive, and constructive simplicity the rule. Secondly, that wherein the production of a grandiose ornamental object is the first consideration, the use to which it is to be applied being of very secondary importance.

Of furniture subordinate to its use there are several objects in the Exhibition that deserve especial attention. Look at the simple form of the piece designed by Mr. Talbert, and exhibited by Gillow & Co.; at the first glance we ascertain its use. The broad shelf, at a suitable height, for dishes and other table requisites necessary to be ready to hand; the smaller nooks for condiments, the upper shelf for silver plate, the cupboards and drawers beneath, and the recessed shelf for less sightly objects, show it to be a sideboard, and not an ornament. Yet how agreeable are the decorative details—panels of boxwood, where in low relief are incised groups of fish, flesh, and fowl, alternating with geometrical forms; the boxwood and the oak, of which the structural part consists, have just enough contrast to be agreeable without the slightest pretentiousness; it is a work of much merit.

Another work on the same principle of constructive utility and subdued propriety of decoration, is the bookcase of ebony and amboyna wood, also exhibited by Messrs. Gillow. Here, again, the subordination of ornament to use, and the treatment of the material, is well attended to, and the result is great propriety and good taste. Messrs. Collinson & Lock's exhibits are in this class. The bookcase in satinwood, with delicate inlays and ivory fittings, and the cabinet with painted decorations, though these latter contrast rather too strongly with the dark framework. Mr. R. Charles, in the works designed for Messrs. Walker & Sons, has sought utility and its simple decoration, and the wardrobe and dressing-tables exhibited by them are in good taste, as is also the wardrobe and dressing table by Messrs. Hunter, with agreeable interchange of materials, inlays, and fittings, though it is a little over-decorated.

(To be continued.)

WATER SUPPLY.

FROM a report by Dr. Liddle on the sanitary condition of Whitechapel district, we find that the constant system of water supply, by the use of waste preventers in the poorer districts, is increasing, and continues to give great satisfaction. Dr. Liddle says:—There are now 146 waste preventers (27 new ones having been erected during this quarter), by which upwards of 850 houses are supplied. So convinced am I of the great improvement of this mode of supply to the poor localities over the old intermittent system, that I have no hesitation in saying that it should be made compulsory on landlords of small tenements to adopt it. The alleged usefulness of the intermittent system, by allowing the surplus water to run to waste and so clear the drains and pans of the closet, is not, in my opinion, of sufficient importance to justify its continuance. The poor are exposed to great danger by drinking water which is contaminated by its retention in dirty and decayed butts, and by its exposure to the air from the want of proper coverings to the receptacles. In many instances, the water is contaminated by the emanations from those privies which are in close proximity to the water receptacles; and which contamination is further increased when the privy and the water-butt are connected, as is frequently the case, by a waste-pipe. I may further add that it is the exception, and not the rule, for the companies to supply water on Sunday, so that the poor are frequently without water on that day, unless they fill their pails and tubs when the water is turned on, and preserve it for future use. But as the poor

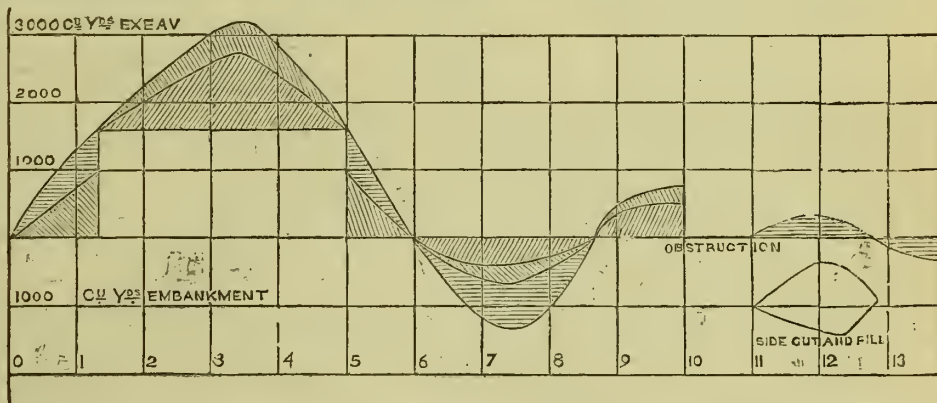
have neither proper covered vessels for holding water, and no other place for keeping their supply, except in their sleeping-rooms, and frequently under their beds, I need scarcely say that water so kept is unfit to drink.

The objections against the supply of water on the intermittent system to the poor localities are so great that I have no hesitation in giving it as my decided opinion—an opinion which has been formed after a long experience—that that system should be discontinued to all the poorer class of houses, and the constant system, by the use of waste preventers, a plan which has been in operation in this district for the last seven years, adopted in its stead. When, however, all those houses now occupied by the poor which are unfit for habitation, are taken down and a new and better class erected, it may be desirable to have a supply of water on the constant system in the interior of every house; but under existing circumstances there is not a sink in any house, nor a vacant space in which one could be fixed, except perhaps in the room which is occupied by a family night and day: but then in such a case the emanations from the sink would render the room unfit for habitation. The proposal, therefore, to supply water on the constant service to the interior of every house is simply impracticable. But whatever may be the result of the New Water Bill in causing the companies to give a constant supply, the butts now in use in the poor localities must be abolished.

ON RECORDING EARTHWORK NOTES.*

EVERY railway engineer knows how important it is to have earthwork recorded in such a manner as to show, without calculation, what quantities either of embankment or excavation, whether of borrow or waste, lie between any two stations. We offer here a simple device to accomplish this end. Represent the stations on an absciss line, the earthwork quantities by ordinates, commencing with 0 at station 0, and representing the quantity of earthwork between this and the next station by an ordinate at the latter. Excavation is to be represented by measurements upwards, or by an increase of ordinate, and embankment in the opposite direction.

If the extremities of the ordinates to a series of stations be connected by a curve line, the points where cut and fill balance will be shown by the intersection of the curve and the abscissa. The



maximum points will show where cut changes to fill, and the minimum where fill changes to cut. A break in the curve either above or below the absciss line, indicates the necessity of wasting or borrowing respectively at that point.

The scale for the whole may be made convenient to the amount of work.

The work of different months over the same line may be represented by curves of different colours or shades.

The labour of drawing the above is very slight; the curve may be drawn on the same sheet as the length profile.

The accompanying sketch of a record of an imaginary earthwork will serve to explain the plan more fully.

EXPLANATION OF ENGRAVING.

Total work to be done represented by outside curve.
From station 0 to 1, 1200 yds. cut.
" " 0 to 2, 2340 " "
" " 0 to 3, 3000 " "
" " 0 to 3 + 20, 3030 yds. cut.
At 3 + 20, beginning to fill.
From station 0 to 4, 2800 ch. yds. cut.
" " 0 to 5, 1420 " "
" " 0 to 5 + 90, 0 " "

* By H. KOCH, in *Van Nostrand's Engineering Magazine*.

Between 0 and 5 + 90 cut and fill are equal.
Between 0 and 6 or 5 + 90 and 6, 200 ch. yds. fill.
5 + 90 and 7, 1180 " "
7 + 40, 1300 " "

At 7 + 40 fill changes into cut.

Between 5 + 90 and 8, 1060 ch. yds. fill.

8 + 60, 0 " "

Between 5 + 90 and 8 + 60 cut and fill balance each other.

Between 8 + 60 and 9, 480 ch. yds. cut.

10, 650 " "

This cut to be wasted on account of obstruction.

Between 11 and 12, 320 ch. yds. cut.

Between 11 and 12 + 95, 0 ch. yds. cut.

Between 12 + 95 and 14, 320 ch. yds. fill.

Between 11 and 12, 600 yds. side cut and 280 side fill.

Between 12 and 12 + 95, 600 yds. side fill and 280 side cut.

The work of two different months is represented by the proper curves.

On first month, between 1 + 35 and 4 + 90, 1100 ch. yds. cut, worked in to fill; 350 ch. yds. left to be done yet.

Between 5 + 90 and 8 + 60, 420 yds. cut, worked in to fill; 780 left undone.

Between 8 + 60 and 10, 450 cub. yds. cut wasted; 200 yds. left.

On second month 1000 ch. yds. are taken from cut between 0 and 1 + 35 to fill between 4 + 90 and 5 + 90; work between 1 + 35 and 4 + 90 completed; 600 ch. yds. cut and fill left undone between 0 and 5 + 90.

Between 5 + 90 and 8 + 60, 220 yds. are moved from cut to fill and 900 left undone.

Between 8 + 60 and 10 work completed with 200 yds. cut, wasted.

SOMERSETSHIRE ARCHEOLOGICAL SOCIETY.

THE 23rd annual meeting of the Somersetshire Archaeological and Natural History Society was held at Crewkerne on Tuesday week, under the presidency of Mr. E. A. Freeman, D.C.L., and was very successful. The proceedings commenced with a meeting of the council of the society at 11.30, and at noon the meeting for the transaction of the annual business was held. The place of assembly was the Town Hall, which was well filled. The annual report and balance-sheet for the past year were read by the hon. sec., Mr. W. A. Jones, and unanimously passed. There was a balance in hand of £47 19s. 10d. The vice-presidents of the society were re-elected, with the addition of Sir W. Medlicott, Bart., of Ven. The treasurers and secretaries were also re-elected. Mr. W. Bidgood was elected curator of the society's museum at

Taunton. After the President's address, papers were read as follows:—By the Rev. E. A. Ellacombe, "On the Mediaeval Church Bells of Somerset;" by Mr. Thomas Boud, "On the Parish of Pendomer;" by Mr. F. H. Dickinson, "On the Statues of Wells Cathedral;" and by Mr. T. Serel, of Wells, "On Somersetshire Records." Crewkerne Church having been inspected, the members partook of dinner at the "George Hotel." At the evening meeting papers were read by Dr. Pooley, of Weston-super-Mare, upon the "Crosses of Somerset;" by the Rev. R. Kirwan, "On the Sepulchral Mounds in the South of England;" by Mr. Buckley, "On Ancient Copes and Embroidery;" and by Mr. Jones, "On Montacute and the Phelps Family," written by Mr. John Batten, who was unable to be present.

EMPLOYMENT OF CHILDREN IN BRICKFIELDS.—

In the act on factories and workshops just issued there is a provision (inserted on the motion of Lord Shaftesbury) declaring that after the 1st of January no female under the age of 16, and no child under 10, shall be employed in the manufacture of bricks and tiles not being ornamental tiles, and the employment of such persons will be an offence under the various salutary statutes in force in factories and workshops.

ARCHÆOLOGICAL.

GERMAN ARCHÆOLOGICAL EXPEDITION TO TROY AND JERUSALEM.—Professor Ernest Curtius, the historian of Greece and late tutor of the Crown Prince of Prussia, will set out in a few days on an archæological expedition to Troy and Jerusalem. The Professor will be accompanied by Major Regely and the well-known architect, Adler, and enjoys the protection of a gunboat specially placed at his disposal.

SAXON REMAINS AT ACKLAM.—A short time ago, a portion of what is thought to be an extensive Anglo-Saxon cemetery was accidentally found on Crown lands, at Acklam-on-the-Wolds (East Riding). Some relics then found were sold by the men for 4s. The Lords of the Treasury have placed the proper examination of the cemetery in the hands of the Rev. Canon Greenwell, of Durham, and it is probable the work will be taken after harvest.

COMPETITIONS.

BLACKBURN FREE LIBRARY AND MUSEUM.—A correspondent says:—"Thirty-eight sets of drawings have been received. From these eight have been selected by the committee, who intend referring them to an architect of repute for his decision. The eight bear the following mottoes:—'Regina,' 'Practical,' 'Veritas,' 'Experientia' (2), 'Fleur-de-lis,' 'Knowledge is Power,' 'Quis Separabit,' and 'Literature.' We very much question if either of the above can be carried out for the stipulated amount. A few of the designs are possessed of merit; the majority bear indubitable traces of 'prentice hands. The *Blackburn Times*, against which a professional contemporary has been running a tilt on the subject, publishes a fair description and criticism of the designs, saving a few inaccuracies which have crept in."

HAMPTON.—The result of the competition for the new school buildings at Hampton for the Kingston Union was as follows:—1st, "Experientia" £8,150, which was found on opening the sealed envelope to be the work of Mr. F. Haslam, A.R.I.B.A., of Henley-on-Thames. 2nd premium of £15, "Two Heads are Better than One." Third, £10, "Masonic Sign;" Fourth, £5, "Justitia." The estimates were all within a little of £8,000.

Building Intelligence.

CHURCHES AND CHAPELS.

BAXTERLEY.—The chancel of the parish church of Baxterley was reopened on the 31st of August, having been restored and remodelled under the direction of Mr. G. T. Robinson, diocesan architect to the archdeaconry of Coventry. The three lights at the east end of the chancel are filled with painted glass, the work of Edmonston, of Manchester, the subject, the adoration of the Magi, the presentation in the Temple, and the centre light, our Lord blessing little children; above, our Lord in glory with sceptre and orb. The bishop expressed his great pleasure at the thorough manner in which the work of restoration had been executed—at the sole cost of the rector—and his hope that before long he might be present at the reopening services of the nave. This is in a deplorable state of repair, all the more visible now that the chancel is restored. The difficulty will be to raise the funds. The fact that Latimer here took refuge when ejected from his diocese will, it is hoped, give a national character to the work.

BERE FERRERS.—This beautiful Devonshire church, built by Sir William and Lady Matilda Ferrers, in the year 1333, and which had fallen into decay, has now been restored, at a cost of about £1,600. The principal objects of interest are, the painted glass window of the fourteenth century, now restored; the canopy tomb and effigies of Sir W. de Ferrers and his wife in the chancel, and that of one of the Champenowne family in the north transept; the deeply-carved oak bench ends, ancient font, the carved marble reredos, hagioscope, and the new organ by Nicholson, of Worcester. The work of restoration has been carried out under the superintendence Mr. E. P. St. Aubyn, the architect, by Mr. W. Blowney, the contractor. The church was opened for public service on Wednesday last.

CHURCH GRESLEY.—The committee have accepted the tender of Mr. Lilley, of Ashby, for the work to be done in connection with the restoration of Gresley Church, and the work will be proceeded with without delay.

DUNDEE.—In August last year the foundation of a chapel and other buildings connected with

the proposed House of Mercy in Dundee was laid by the Bishop of Brechin. Besides the chapel, new accommodation has been provided for a schoolroom, and a hospital for incurables. The chapel, which is 38ft. long and 18ft. wide, was designed by Mr. Street, of London. The style is thirteenth-century Gothic. The large altar is of stone, and is surmounted by an elaborately executed reredos of alabaster and marble, by Mr. Earp, of London, representing our Lord in His humiliation. The flooring is laid with Minton's tiles. The stalls are plain, and of oak. The opening and consecration of this chapel took place on St. Bartholomew's Day, the Bishop of Brechin officiating.

LYNNMOUTH.—The new church of St. John the Baptist, Lynmouth, North Devon, the foundation-stone of which was laid on the 24th of June, 1869, has just been opened. The church has been built by subscription of residents and visitors on a site presented by Mr. Lock Roe, the principal owner of property in the parish. There is at present neither font nor pulpit provided. Mr. E. Dolby, of Abingdon, is the architect. The church is free and unappropriated.

OLD COATS.—The new (Roman) Catholic Church, of St. Helen, Oldcoats, is completed. The architect is Mr. S. T. Nicholl, of London, and the style adopted is fourteenth-century Gothic. The material used for the walls is Roche Abbey stone, and cedar has been very much used for the woodwork. Mr. J. Athron, of Doncaster, is the builder.

PAIGNTON, DEVON.—A public meeting was held on the 22nd ult., under the presidency of the Rev. W. Poland, the vicar, to consider the question of restoring the parish church. Designs for the restoration have been prepared by Mr. Ewan Christian. The estimated cost is £3,250, embracing £120 for bells, £200 for a new clock with four dials, £200 for lighting and warming, and £250 for a new organ. The amount already contributed is £341 5s. 2d.; sundry other contributions are promised. Conflicting opinions were expressed, somewhat strongly, concerning the removal or maintenance of the existing galleries. A committee was ultimately appointed to consider the question.

PLYMOUTH.—The interior of the Catholic Apostolic Church, Plymouth, has recently received enrichments of an elaborate character, which greatly enhance the effect of the interior. Stained glass windows from a London firm have been fixed in the sanctuary. They are of an extremely ornate description. The blocks of stone, which, at the alteration and enlargement of the building a few years ago, under the direction of the architect, Mr. H. Elliott, were left for carving at a future time, have also been taken in hand, and have been cleverly carved by Mr. Harry Hems, of Exeter. The corbels over the sanctuary represent cherubim and seraphim hovering with outstretched wings on either side of the emblems of the sacrament—wheat ears and the vine; whilst those supporting the roof timbers of the nave have sculptured and carved foliage of a natural type introduced into them. On four of these are the heads of the apostles. There are also the heads of some females. The remaining corbels are of foliage of a scriptural type, the passion flower, the lily, myrtle, pomegranate, rose, &c., and contrast prettily with the other sculpture.

SALISBURY.—The restoration of the choir of Salisbury Cathedral, as a memorial to the late Bishop Hamilton, is now proceeding rapidly. During the past week the Dean and Chapter have engaged Messrs. Clayton & Bell to execute the decorative part of the work, their contract amounting to £970. It has been found impossible to remove the yellow wash covering the large painted medallion on the roof. The paintings of the vault and spandrel are to be restored delicately, and with as much reserve as possible. The entire expense of the works in hand will be £6,566; the subscriptions promised reach £9,042. It has been promised that the stalls and substage should be restored, and a new throne be provided, with new pavement, sedilia, &c., at a cost of £4,000. The remodelling of the organ will cost £1,500, and the new pulpit £300. The grilles at the side of the altar are set down at £450.

TOWCESTER.—The chancel of the parish church, Towcester, is about to be restored, under the direction of Mr. Ewan Christian, architect to the Ecclesiastical Commissioners.

WORCESTER.—On Wednesday the Bishop of Birmingham, assisted by Bishop Brown, of Belmont, consecrated the new (Roman) Catholic Church of the Abbey Stanbrook, near Worcester. The church is but a first instalment of the new abbey buildings, which, when finished, are to accommodate one hundred religious persons, with apartments for the same number of young ladies. The interior of the new

church contains every feature of a monastic church of the Middle Ages. The stalls and choir screens are of New Zealand satinwood. The organ case is by Messrs. Farmer & Brindley, is an extremely fine piece of wood carving, the spandrels being filled with angels in the style of the Nuremberg work of the fifteenth century. The altars are by Messrs. Morley & Boulton. The pavement, by Messrs. Minton, Taylor, & Co., is composed of marbles interspersed with encaustic tiles, with emblems appertaining to the Benedictine order. The chancel rood and screen, by Mr. Hardman Powell, is wrought in iron. The whole of the interior of the church is of Caen stone, the exterior of Bath and brick. The building will cost about £10,000, and is executed from the designs of Mr. E. Welby Pugin.

WORCESTER CATHEDRAL RESTORATION.—The work of restoration at Worcester Cathedral is being carried forward rapidly, under the superintendence of Mr. Perkins, architect. The decoration of the ceiling is by Hardman, of Birmingham, who will also supply the ornamental gas standards for the choir and the fittings for the nave. Mr. Poole, London, is the contractor for paving the choir and aisles. The ancient stone pulpit will not be disturbed, but it has been decided to remove the canopy or "sounding board." It is expected that the choir will be ready for service before the holding of the Festival next year.

BUILDINGS.

HARROGATE.—On Saturday week a new suite of baths was opened at Harrogate. To meet a long-felt want, the Harrogate Improvement Commissioners determined to build a suite of baths for the mineral waters, and accordingly the foundation-stone was laid in April last. The architect is Mr. Richardson, surveyor to the local board, and the cost is about £20,000. The building, which lies between the Spa and Promenade Terrace, presents a bold and handsome appearance, whilst the interior is fitted up in a singularly complete and elegant manner. There are waiting-rooms on each side of the entrance which leads to the manager's office, built upon the circular plan, so as to command a view of the corridors, 200ft. in length. The bath-rooms are placed on each side of the corridor, those in the west wing being for ladies, and are 10ft. by 11ft. in size. The sulphur water baths themselves are 18 in number; also four vapour baths and four shower baths; whilst at each end of the bath are swimming baths, one for ladies and the other for gentlemen, the latter being 68ft. in length.

ILKLEY.—The Bishop of Ripon laid the corner-stone of the new National Schools in connection with the parish church on Saturday. The new schools are to be built from the designs of Messrs. T. H. & F. Healey, of Bradford, and they will have accommodation for about 300 children. The block plan shows the building to be T-shaped. The main portion of the block is to be occupied by the older children, the school for the girls being 50ft. in length, and for the boys 52ft., the width of each being 20ft. A movable partition in the middle will allow of these two portions of the building being thrown into one large apartment, convenient for the purpose of holding public meetings. There will also be an infant school 48ft. in length, by 20ft. in width, and class-rooms for the senior scholars. The style is Gothic. The walls are to be hammer-dressed, the windows having ashlar dressings. The principal contractors for the various works are Mr. Edmund Dean, mason; Mr. Wm. Hartley, joiner; Mr. Thos. Hall, plumber, all of Ilkley. The outlay will be about £2,500.

IRONBRIDGE.—It has at length been decided to erect the new workhouse on land adjoining the Lodge Farm, on Lincoln-hill, in the parish of Ironbridge. The buildings are to be erected by Messrs. Nevett, builders, Ironbridge, from designs by Messrs. Had-don, Bros., of Great Malvern and Hereford. They will be plain red structures in the Doric style, and will cover upwards of an acre of land. The cost, including the purchase of land and other incidental expenses, will not be much less than £10,000.

MANCHESTER.—Extensive workshops are in course of erection at Cornbrook, for Messrs. M. Ogden & Co., of Deansgate, by Messrs. R. Neill & Sons, from designs by Mr. W. Murray Smith, architect.

ROTHESAY.—The local authority of Rothesay has instructed Mr. Hunter, the Burgh Superintendent of Works, to prepare plans for a new hospital for contagious diseases; the cost to be £1,000.

STRANRAER.—A special meeting of Commissioners of Supply for the county of Wigtown was held in the Town Hall, Stranraer, on Friday, for the purpose of considering and deciding on the offers for the new Court-house. A committee recom-

ded the acceptance of offers amounting to £6,460, Messrs. A. Herbertson & Son being the successful offerers for the mason and joiner work, which was agreed to, and the meeting further approved of the revised plans, specifications, and working drawings of the new Court-house, assembly-room, and police buildings prepared by Messrs. Brown & Wardrop, architects. It was remitted to the committee, to enter into contract with the tradesmen whose offers had been accepted.

TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

WALTER CHESTERTON (Ottawa City).—Characteristic particulars of Canadian construction would have an interest to English readers.

W. P. TAYLOR.—We would gladly publish any particulars you may wish to send on smoky chimneys.

W. NOTTLE.—Your reply is an advertisement.

C. P.—The principle of fertility in Nature.

STONEMASON.—You have written with such bad ink that we cannot decipher your writing.

W. MILNER.—Next week.

G. M.—Letter on "Covered Wells" next week.

J. B. M.—Two shillings each.

RECEIVED.—C. F. H. & Co.—H. & C.—D. G. B.—J. P. S.—B. A.—W. H. J. H.—C. L. E.—C. B. A.—A. C.—S. & Co.—W. G.—A. & C. H.—M. T. W.

Correspondence.

FROM A YOUNG ARCHITECT.

To the Editor of the BUILDING NEWS.

SIR,—I am a young architect, and it has always been my study to design on strictly truthful principles, down to the most minute details; to calculate for and provide ample strength and solidity in my buildings before I allow myself even so much as a moulding. I read the best architectural books, and study and sketch old buildings and other artistic productions, striving by every means in my power to become an art-architect, and to follow in the path of the pioneers of architecture. I am not the best judge of my own success; but I cannot forbear expressing the mortification I felt when I saw the rejected design of Mr Godwin for the Winchester Town Hall. It is most discouraging. Here is a design, full of pure and noble beauty, a mine of wealth to an artist, thrown aside for a production full of inconsistencies and the worst of detail, absolutely without scale, or unity of expression, or picturesqueness of grouping, or dignity of mass. The moral of the matter is just this: that if I strive to obtain fulness of artistic power, purity, dignity, and grace, I am only erecting a barrier between myself and the building public.

Whose fault is it? I think that the senior and wealthy members of the profession, who are not dependent on competitions for the chance of a good opening, ought to feel it incumbent on them to take some action in the matter. I know they would rejoice if quacks were excluded from the architectural as they are from the medical and legal professions, and I know that the Voluntary Examinations are preparing the way for compulsory tests; but cannot something be done at once to prevent the host of builders, clerks of works, and house agents (styling themselves architects) from sapping the foundations of our existence? We young men can do nothing in the matter but suffer and wait, and, it seems, grumble; and we look to our seniors for protection; to them it may be a question of one job more than the few dozen they may have in hand, but to us it may be our very income. I myself have already suffered severely for my principles, and I intend to suffer again, if need be; but the sooner it is at an end the better.

I do not see why a similar course to that adopted by the medical profession some years ago should not be taken by us now.—I am, &c.,

PRINCIPLE.

ECCLESIASTICAL DILAPIDATIONS ACT, 1871.

SIR,—You inserted some remarks last week extracted from a letter to the *Guardian* by the Rev. J. G. Joyce, relating to the surveyors' charges under this Act. I have paid great attention to the subject, and shall feel obliged if you will permit me to explain my views. I have now in the press a treatise, which I have called a "Handy Book," on the law, which will shortly be published by Messrs. Rivingtons, and therein I have expressed opinions which differ considerably from those of the surveyor of the diocese of Winchester, as represented by the letter above referred to.

The Act directs the surveyor to "specify in detail." I ask, then, what the work, when done, can be otherwise than a specification? and, if it be in detail and properly executed, I cannot understand how it can be anything short of a detailed specification. For this, of course, the surveyor should be fairly paid, and the charges under the Act should be sufficient to remunerate him. It is evident that, as the Act directs the execution of the repairs, a specification to which a builder can work must be prepared, and it may as well be done at once. Such a survey as proposed in the letter referred to, purporting to set forth the views of the Winchester diocesan surveyor, would be of no practical value.

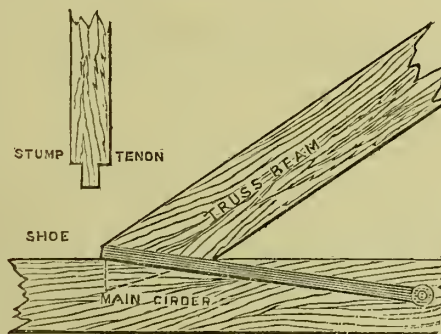
There should be some uniformity in the scale of charges, and it would be well if a conference, for comparing the scale proposed in each diocese, were to meet, before they were finally adopted in any. I have suggested a scale in my little book, and shall be glad to furnish you with a statement if you are disposed to allow the question to be debated in your pages.—I am, &c.,

EDWARD G. BRUTON, F.R.I.B.A.

Oxford, September 2, 1871.

NOTES ON CARPENTRY.

SIR,—In the article on this subject in your issue of August 18th (page 116) the usual mode is given of securing the foot of the truss-beam, but it is not the most perfect. For, in the first place, the thrust of the foot of the principal is horizontal, not perpendicular, to its back, as implied by the direction of the bolt. Secondly, that in the settlement which always takes place, the bolt will produce excessive cross strain; and, finally, because no dependence should be placed on the notch in the tie-beam, a part much subject to decay.



I, therefore, take the liberty of enclosing a diagram of a shoe or foot-strap that is free from all the above-mentioned defects. It will be seen that the strap is entirely independent of any settlement, and throws the strain far back from the end. Also, that as the bolt passes through the centre line, it does not weaken the timber.

The tendon merely serves to secure accuracy of construction, as well as to prevent side slip.—I am, &c., C. E.

Reading.

EXTINGUISHING FIRES WITH GAS.

SIR,—On page 68, it is stated that a company in New York proposes to lay down pipes to carry carbonic acid gas, which, in case of a fire, is to be played on to the premises, whereby the flames will be immediately extinguished. Very likely; but what will become of the firemen and the crowds of lookers-on if the wind should happen to blow the gas on to them?—I am, &c., C. P.

EMIGRATION AS REGARDED FROM A CANADIAN POINT OF VIEW.

SIR,—As emigration is becoming so important a feature at the present time, perhaps a few words on the subject, as viewed from this side of the Atlantic,

will not be entirely without effect. There is little doubt that there is room enough in this vast continent for as many as are prepared to come, and there is plenty of work to be had, both in the farming country for agriculturists, and in the cities for mechanics. I will not now enlarge upon the farming question, but rather upon the opportunities afforded to the mechanics, partly because the farming question has been pretty liberally discussed, and partly because the prospects of the artisan come more within the scope of this paper.

At the outset may be mentioned an unfortunate fact, that the probable emigrants in England have the idea strongly rooted in their minds that anything will do for the colonies, and that it is merely sufficient for a man to be able to handle a jack-plane to convince the world that he is an experienced tradesman, and is entitled to equal remuneration with those who have gone through their regular apprenticeship. Now, though this idea is strong enough to start a man from his home and country, yet the chances are many that he will find considerable difficulty, upon arriving in this country, in persuading people to that extent.

The quality of trade, in many parts, is bad enough, I own; but there is, nevertheless, a strong desire to improve. Men who can afford to build are striving to have the best workmanship that can be got for their money, and will not be satisfied if they think that the quality of work does not bear a fair proportion to the money expended.

I think, too, that, as a rule, the good tradesman does not care to emigrate; for he, being a good tradesman, has a greater chance of getting sufficient work to insure his daily bread, and, caring for little more, does not trouble himself with thoughts of breaking up his home, and so leaves the field to the mere superficial mechanic, who, elated with personal esteem in inverse proportion to his capabilities, fancies the colonists are "green," and that he has nothing to do but go about the country and just do what he chooses.

We undoubtedly want labour, but we want it good; we want men who, having a thorough knowledge of their trade, can, nevertheless, conceive it possible that improvements may be made, even upon old country customs. I had no idea that Englishmen were such boasters until I came out here, and continually remarked the conduct of my fellow-countrymen. They think that any one who is not an Englishman, or educated in England, must of necessity be deplorably inferior to them; but there are some good tradesmen here who, in certain particulars, are not greatly behind the boasting Englishman. I often think that my countrymen would do better if, instead of proclaiming their superiority, they were to go to work quietly to raise the standard of work throughout the country, a much more silent and much more noble thing, it seems to me.

All who come out to a new country must be prepared to walk humbly at first; but it is equally certain that, if any good tradesman will bear the test, he will find prospects open to him that were not possible in England; but he must make up his mind to endure many things. He has got to earn a reputation (in fighting our way through the world we carry our destiny in our hands, and there is nothing we do but in the manner of doing it we help to form our future); but if he be true to himself he need have nothing to fear.

The system of building in this country is, in a great measure, favourable to a good mechanic, for we have very few large capitalists, all buildings being let by tender. The work of a separate trade is again let to others, so that if a man coming here were to give up a year or two, and work as a journeyman, in order to get used to the different systems of building; and if he were wise enough to save as much as possible, so that in a short time he would be in a position to accept a small contract himself, or a part of one, as the opportunity presented itself—when he had gone thus far he might look forward to the future with confidence. His fortune then would be in just proportion to his ability and character.

If there is one point more than another I would wish to urge upon those who meditate emigration it is the extensive importance of self-command and high moral character. Intemperance is the curse of this country. I have seen, only too frequently, men who, were it but for that, could have made enough in a few years to keep them comfortable for the rest of their lives, and enable them to give a good start to their children, but now are wasting their life, work, injuring themselves, and laying in store plenty of unhappiness for years to come. If men would but consider these things, and endeavour to live according to the eternal and divine laws of Nature, to be temperate in all things, they would then begin to see that in obeying them they go far to insure contentment, if not happiness.

But it may be said that if those desiring to emigrate are not fit to go—have neither knowledge sufficient for themselves or for others, what is to be done for them, and what are they to do?

Something, surely, can be done for them in this age of colossal hospitals, Peabody-buildings, and refuges of all kinds. Surely in an age when societies are formed to look after the welfare of animals, when homes are provided for destitute dogs, something may be looked for—not altogether in vain—for our poorer brothers? Granting, then, that something may be expected, the next question presents itself—namely, What? It has been said that the bulk of those who wish to emigrate are not fitted for their new position in a strange country. Were it not well that they should have the opportunity of becoming so? Suppose, then, that in every parish—or at least in those parishes from whence emigrants are sent—there were to be procured shops, and men who would teach the various trades most likely

to be required—where, in fact, intending emigrants may come to learn, then, before they can receive aid from any society, they shall be required to produce a certificate to the effect that they can do something. These shops, with due care, might be made self-supporting, or nearly so, and would be found a substantial good, not only helping others, but helping them to help themselves.—I am, &c.,

WALTER CHESTERTON, Architect.
Ottawa, Canada.

THE INTERNATIONAL EXHIBITION.

SIR,—I have received from Mr. Slater a letter referring to a drawing of the choir of Sherborne Abbey, exhibited in the International Exhibition, and mentioned by me in my official report. Messrs. Carpenter & Slater are anxious that it should be known that this drawing, a very excellent one, and representing their restoration of this building, is from the pencil of Mr. Burbage, and that it is by an oversight that his name is not inserted in the official catalogue as the artist. As my report appeared in your columns, you will, I hope, permit this correction to receive equal publicity.—I am, &c., T. ROGER SMITH.

57, Strand, London, W.C., September 5, 1871.

Selected Correspondence.

[The following correspondence has appeared in the *Times* during the past week.]

THE LAW COURTS AND MODERN ARCHITECTURE.

SIR,—The appeal of S. Thomas's Hospital for £20,000, because their new buildings have cost more than £500,000, following the Government rejection and your criticism of Mr. Street's revised and amended plans for the Law Courts, suggest some reflections which might save a great deal of such disappointment and of bad architecture.

Why has this hospital cost (I believe) more than double the usual sum per bed, and, by their own showing, so much that they cannot quote a precedent in England for it? Let anybody look at it for five minutes, as I have done for five months from the opposite windows, and say whether there is not twice £20,000 wasted in what Mr. Ruskin called "monstrification," or a heap of superfluities which only make the building uglier.

I know that architects may retort that nobody has preached so eloquently as he has in favour of "ornamentation," and that it is only a question of taste whether things are to be called by that name or the other. I have no brief to defend his consistency, but some of his phrases are expressive and convenient.

But how long is public money for every kind of institution to be wasted for the benefit of architects and builders without producing any building worth looking at twice? How many people have lost all the money they invested in grand hotels because the architect has been allowed to spend what he chose in carving and gilding and marble beyond the power of the innkeeper to take it out in charges for dinner afterwards? Look, too, at those marble columns "all standing naked in the open air" of that hopelessly finished hotel in Lincoln's-inn-fields.

Where, again, has there been a set of competing designs exhibited in which the competitors have not presumed on the ignorance and bad taste of the judges, or gratified their own by overloading them with showy decoration and fictitious depths of shadows? And then they omit the latter by thin and shallow building, and reserve to themselves power to increase the former without limit, unless their contracts happen to be overhauled by somebody who has bought experience dearly.

The idea of making buildings handsome by their proportions seems to have perished out of the earth. Those who call themselves Gothic architects are generally understood to profess the principles at least of the real Gothic architects. Yet one would think from their works that most of them never opened the books in their libraries except to pick a hit here and a hit there from the architecture of all countries and throw them together anyhow, and especially that they had never learnt that the Gothic architects, no less than those of every real style that ever flourished, made symmetry their rule and lopsidedness only an exception, to be allowed when necessary; though they never carried symmetry to the absurd excesses of the Vanbrugh school of revivalists of Italian architecture.

Mediaeval architects, too, were not afraid of making 12 or 13 bays of a long building all alike, except sometimes in minor details; while Mr. Street and many of his brethren cannot give us three or four in succession without some startling variation to avoid their great bugbear of "monotony." And

yet their buildings are monotonous, in having but one tone of fustiness and overdoing, and want of repose everywhere.

The ancients, too, of all styles had ideas of proportions, and an eye for it, if they had no defined rules. They did not plant huge towers in odd corners with features of gigantic size, and a number of small ones close by, like pieces of York Minster and a private chapel stuck together; or with short gables running out of them which do not seem to know whether they are transepts or porches; or fancy they could produce grand effects by height out of all proportion to the length of a body or the width of a tower; or show their originality by queer surprises, such as throwing up a gable or two in the middle of what is naturally a continuous roof; or any of the other elaborate monstrosities which one now sees in shoals.

If this is the fruit of the demand of the architectural writers of the last 20 years for a new and original Victorian style, I am glad to think that "in my trumpery sphere of action" (as Sydney Smith said), I have done all I could to resist it, both in writing and in designing sundry churches and other buildings. It will come of itself, if it can come; not by forcing. The only thing that can be called the Victorian style is that jumble of the details of all other styles which some people call "eclectic," and others advocate in other terms, and of which contempt of proportions and symmetry, and an accumulation of ornaments, seem to be the leading characteristics.

Everything that is permanently pleasing, both in art and in mankind, must have that undefinable quality called repose, which involves (though it does not only mean) simplicity. And our architecture will go on getting worse and worse, more and more vulgar, if this passion for over-decoration is not stopped and old principles restored. Does Mr. Street imagine anybody but himself will think his great vaulted hall equal to the grand simplicity of Westminster, which wants no statues?

Yours obediently,

E. B. DENISON.

P.S.—As I have several times sent you notes of the sizes of large churches, I take this opportunity of mentioning what probably nobody knows, that the old monastic Norman church of Bury S. Edmunds came next in capacity to Cologne, which, with Amiens, follows York among the churches of Europe. It had, moreover, the longest nave and the largest transept north of the Alps, except old S. Paul's, and its west front was longer still and flanked with two large octagonal towers, 30 ft. wide inside, besides the central tower and another in the middle of the west front. Yet its two sides were perfectly symmetrical, according to the plan in Yates's "History of Bury," and so they were in all our cathedrals but for alterations.

THE PROPOSED COURTS OF JUSTICE.

SIR,—The letter of Mr. Denison in the *Times* of this morning calls attention once more to the above important subject. I have no intention of following him in his criticisms on S. Thomas's Hospital, because it is admitted on all hands that it is a building admirably adapted for its purposes. It does not appear to me to be in any manner over-decorated; all the colonnades and passages are essential to its uses, and if the treasurer thinks it right to appeal to the public for assistance in the cost of the fittings, at all events he is nobly followed by his personal friends; he has raised a large portion of the £20,000 he wants, and doubtless before long he will get the whole amount; and, lastly, this hospital must have, even in the eyes of Mr. Denison, the great merit of being one of the largest public buildings recently erected not in Gothic style. Mr. Denison refers in terms of satisfaction to Mr. Ruskin; but I know of no man who has done more to debase the public taste in architecture than this gentleman (*vide* the "Seven Lamps of Architecture"), for he introduces on all occasions and bepraises the very worst type of Gothic architecture in Europe—viz., the Venetian-Gothic. But, leaving these not very important matters, I come to the very grave question of the style of the Courts of Justice.

I am informed, upon the best authority, that Mr. Lowe has objected to the elevations proposed. He laid the drawings in the Library of the House of Commons as soon as he had them, with the hope that they would be equally objected to by the House; for, as he expressed himself to a friend of mine, he wanted the "form and mass." Mr. Denison approves, instead, of the laboured and useless detail of the intended building. But, unluckily, at that time the House was engaged upon the great political questions of the session, and these drawings attracted

but little attention. What is now to be done I know not; but I feel this, that if the design shown by those drawings is to be carried out, it will be not only to the regret of all cultivated Englishmen, but when the learned Italian and French architects visit our country they will be as much astonished as my friend Canina was on coming to England, at the unaccountable freaks and vagaries to be seen in our modern public buildings.

I am, sir, your obedient servant,

September 1.

ANTI-GOTHIC.

THE NEW LAW COURTS.

SIR,—In common with every person with whom I have conversed on the subject, I feel indebted to the *Times* for the article which has aroused public attention to Mr. Street's revised designs for the New Law Courts. There cannot be a doubt that if these designs had been attentively considered by Parliament, or if they had been considered at all, they would have met with such an amount of disapprobation that Mr. Lowe would have felt himself justified in refusing to accept them. But, as they lay for many weeks in the library of the House of Commons and were not challenged, Mr. Lowe may naturally have come to the conclusion that Parliament had accepted them. He, therefore, may be unwilling to reopen the subject, and acquiesce in designs which, if carried out, will be the crowning act of our many artistic failures, and a discredit which will never be forgotten both to the Government which has sanctioned and to the nation which, although warned through your columns, has tolerated such a structure.

It is true that these designs provoked no debate in the House of Commons—but why? Because such was the pressure of Government business that it was impossible for any private member to delay the winding-up of the Session by raising a discussion on that or any other subject; and because, during the present Parliament it has been the policy of the Government, through their Minister of Works, to snub and sneer at every member of Parliament who has at heart the artistic advancement of his country as being a dilettante amateur, and consequently rather a contemptible creature than otherwise. Under these circumstances many members who to my knowledge would have wished to criticise these designs and arouse public attention to the catastrophe which is impending have shrugged their shoulders and held their peace rather than subject themselves to official impertinence.

I am truly sorry for Mr. Street, who is a man of undoubted talent, that these adverse opinions of his work should fall like snow flakes from every quarter; but for his own sake it is far better for him to hear the worst now rather than be handed down to posterity as the author of a great national discredit. For Mr. Street's sake, therefore, as well as our own, I trust Mr. Lowe will have the courage, for it surely cannot be too late, to insist on a new design. He should bear in mind that this is not the original design which was approved by the Commission. It is something very different indeed, or the selection would have conferred but little credit on the judges. This design has never been subjected to any competition whatever. There is not an architect who competed some years ago for the construction of the Law Courts who has not grave reason to complain that such a design as this has been preferred to his, and that, therefore, the inference will be drawn that his design must have been even worse.

After so many delays and hesitations the delay of another year would surely be but as dust in the balance in comparison with the substitution of an aggregate of detached and highly ornamented almshouses for the Serene Temple of Justice, combining majesty, union, and purpose, which the nation expects and demands. Though Parliament has been silent, I trust the Press will make itself heard in this emergency, and induce the Government even now to interfere. Should the Chancellor of the Exchequer have sanctioned these designs no one can imagine that Mr. Street would hold him to a sanction which, if he will but appeal to the judgment of his professional friends, he will soon ascertain will be the ruin of his rising reputation.—I remain, Sir, yours obediently,

September 5.

X. Z.

VALUATION OF LANCASHIRE.—The *Bolton Chronicle* says the re-valuation of Lancashire now being made is expected to show an increase upon the valuation of 1864 of at least £2,000,000. In Liverpool there will be the greatest increase, the difference in the two valuations being £300,000, arising chiefly from the property of the Mersey Docks and Harbour Board.

Intercommunication.

QUESTIONS.

[2304.]—**Cement.**—Will any contributor oblige me with information as to the best way of "stopping" cracks in cement?—P. JONES.

[2305.]—**Thatching.**—In thatched houses, as a prevention against fire, is there not a wire used as a covering for the chimney? If so, will any reader state where such wire can be obtained?—P. (Bath).

[2306.]—**Mortar Mills and Mixers.**—It has frequently occurred to me that, notwithstanding that most architects and civil engineers require, for works of any magnitude, that the mortar shall be ground in a mill, that the sand originally sharp and angular becomes, by the attrition of the heavy mill stones, rounded, or, as the workmen say, "soft," and if the grinding is with a large mill, and is continued for any length of time, the sand must become pulverised very finely. This, we know, cannot beneficially affect the mortar. Can any reader inform me whether there is any other satisfactory method of mechanical mortar-mixing other than grinding? Whilst writing on this question, I may mention that the edge-runners of a mortar mill, no doubt, very satisfactorily crush all small pebbles; but, on the other hand, the mortar comes from the mill sloppy, and not stiff, as most authorities recommend. Would it be beneficial to have a quantity of mortar made by mill heaped for a considerable time, and then beaten up with a small addition of water, as required for use? This would give a good stiff mortar.—H. Q.

[2307.]—**Marine Glue.**—Will some kind reader inform me of the best method to prepare and use marine glue, to be used to fill in the joints of a floor?—J. B.

REPLIES.

[2261.]—**Fireproof Flooring.**—The "French" methods of forming such a floor are described in the Sessional Papers of the Royal Institute of British Architects, of some twelve years since.—C. P.

[2288.]—**Water Impregnated with Lead.**—Lead pipe can be got, tinned both outside and inside, at a cost of a few shillings per cwt. Any lead merchant ought to be able to tell "F. H." where to get it. Lead pipes can also be got with a tin pipe put through them; but this latter plan is much more expensive.—PLUMBER.

[2293.]—**Indian Ink.**—In reply to "H. W.'s" query, as to an insoluble Indian ink, Stanley, of Great Turnstile, Holborn, has prepared an admirable solution, which would be found useful. However, if "H. W." (using good ink) were to mount his tracings before colouring, he would rarely, if ever, find it run.—M. B. A.

[2295.]—**House Cistern.**—The "trumpet waste-pipe," or "double cesspool" (depicted at page 166) is filled by the hand, and, in the course of time, often dries up, when, of course, it is useless. If made, however, with sufficient "drown" (about 6in.), it can be made to act upon the same principle as the self-acting bell-trap I sent up sketch of—viz., by boring three small holes at a proper height, as at A, so that it might be self-acting, as per sketch. I prefer the bell-trap, however; it takes up less room, is not so clumsy, and stands upright all round.—PLUMBER.

[2295.]—**House Cistern.**—As I commenced the discussion on the trapping of waste-pipes from house cisterns, by my query in BUILDING NEWS of June 23rd last, I have pleasure in thanking our correspondent "Plumber" for his reply in the number for June 20th, and for his sketch illustrating a very capital trap for the purpose. If our correspondent "Q," whose query is contained in the last number, will read my original query, he will see that the objection to his form of trap is, that only upon rare occasions, such as the accidentally sticking fast of the ball-cock, will the trap ever be filled with water, and that, therefore, it will be no trap at all. In reading "Plumber's" letter, I would also refer "Q" to an erratum contained in a subsequent number.—A. H. B.

[2297.]—**General Joiner.**—The best thing that "Joiner" can do is to apply to S. Worssam & Co., Chelsea, and get a small one to be driven by steam. If he had one to go by manual power it would not satisfy him.—J. B.

[2298.]—**Surveying Hilly Land.**—In surveying hilly land, the distance actually chained must be reduced on plan to the projection of that distance, on a horizontal plane, by means of a "correction" in links or fractions of a link, to be deducted from each chain.—C. B.

[2298.]—**Surveying Hilly Land.**—Horizontal.—F.

[2298.]—**Surveying Hilly Land.**—The horizontal measurement is taken, because no more trees, &c., will grow, nor can more buildings be erected, upon the side of a hill than upon a level piece equal in area to the base of the hill. For labour—such as reaping, ploughing, &c.—the hypotenusal measurement should

be taken, as the sickle, plough, &c., passes over the surface of the hill, and not at right angles to the cross, or parallel to the base.—RUVL.

[2298.]—**Surveying Hilly Land.**—For general mapping purposes, the horizontal measurement is taken; for agricultural or other special purposes, that of the surface.—P. E. M.

[2300.]—**Land Surveying.**— $d f$ is the line required = 395. The distance, f , should be 980, which it scales. This is doubtless a printer's error.—C. B.

[2302.]—**Incompetent Architect.**—The right of a proprietor to dismiss his architect in the course of a contract was discussed, and to some extent allowed, in the BUILDING NEWS several months ago. Besides conducting to dismissal, incompetency would expose an architect to consequential damages. But the gross and injurious nature of the plea, if not substantiated, ought, on the other hand, to bring down upon "a proprietor" most exemplary penalties.—ANOTHER T. M.

[2302.]—**Incompetent Architect.**—The proprietor can certainly discharge the architect should he prove incompetent, or else the proprietor would suffer grievous wrong. But it is highly probable that the architect so discharged would be recalcitrant, and try the case at law.—P. E. M.

WATER SUPPLY AND SANITARY MATTERS.

THE POLLUTION OF THE RIVER DARWEN.—A short time ago an action to recover £25,000, from the Corporation of Blackburn was brought by Sir William Henry Fielden, Bart., as compensation for damage done to his residence, Feniscowles-hall, and the surrounding estate, by the pollution of the River Darwen through the Corporation of Blackburn turning the sewage of the town into the Blakewater, a tributary of the Darwen. The matter was referred to the arbitration of Mr. Manisty, Q.C., who assessed the damages at £1,250, and ordered the Corporation to pay costs. Sir William is now about to seek further compensation, this time from the Over Darwen Local Board.

SOUTHWARK.—The *South London Press* states that the Southwark and Vauxhall Water Company have, in anticipation of the spread of cholera to our shores, written to the Vestry of St. George's, offering to erect, at their own expense, stand-pipes for the use of the inhabitants living in crowded localities, and who have not proper means for storing water. The stand-pipes are to be in use for two hours daily.

TOTNES.—The Totnes Town Council has decided to take into consideration a scheme for draining the whole borough.

MANCHESTER.—A project is on foot for providing the Hulme district with a cottage hospital for children.

THE SEWAGE DIFFICULTY.—It is evident (says the *Pall Mall Gazette*) that we have yet a great deal to learn upon that most unpleasant subject, the utilisation of sewage. Two of the most important Midland towns, Birmingham and Coventry, have failed in their attempt to establish a sewage farm; and against the latter place a charge is brought that it not only destroys the health of its own inhabitants, but also poisons the water supply of Warwick. If it be an undoubted fact that sewage can be made a source of profit, we should have thought that at any rate at Birmingham there would have been a keen struggle to get possession of so valuable a piece of property, and that much ingenuity would have been displayed in making the most out of it. Are we to ascribe the failure—a disastrous one under present circumstances—to the fact that the collective wisdom of a corporation mis-manages matters which, if left to the common sense of an individual, would go right? At Coventry a private association has been started for the purpose of doing the work of the public functionaries. If it succeeds the ratepayers will have good reason to complain that their interests have been sacrificed to the apathy or ignorance of their representatives. But there is also a fear that while the experiment is being tried, a far more terrible sacrifice may take place.

SALTBURN-BY-THE-SEA.—The half-yearly meeting of the shareholders of the Clevedon Water Company was held at Saltburn on Monday fortnight. The directors recommended that a dividend at the rate of 5 per cent. per annum, be declared payable on the 1st of September, and that £150 be added to the reserved fund. This will absorb £430 8s. 8d., and leave a balance of £57 14s. 10d. to be carried to the credit of next half-year's account. The directors report that since the last general meeting the company's pipes have been extended to the village of Upper Marske, and by a further extension of half a mile a connection can be made with the pipes of the Redear Local Board of Health, whenever their source of supply is drained by the Upleatham ironstone workings. The district supplied by this company includes Saltburn, Skelton, Brotton, and Upper Marske, and the company's workmen are engaged in extending the pipes to the village of Marske. The Chairman moved the adoption of the report, which was seconded by Mr. R. Thompson, and carried unanimously. In answer to a question, the

Chairman stated that the reservoir which it is proposed to construct at Lookwood Beck Bridge would cover about 42 acres.—The Chairman then moved that the sum of £18,000 be raised under the powers of, and for the purpose authorised by, the Clevedon Water Works Act, 1871, and that for such purpose the directors of the company be authorised to issue 1,800 new ordinary shares, at £10 each, at such times and in such manner as they shall think fit.—Mr. J. E. MacNay seconded the motion, which was carried unanimously.

THE VENTILATION OF SEWERS.—The general ventilation of sewers is no new proposal, but has been recognised as a necessity by many eminent engineers. The whole of the main sewers devised for Lancashire by Mr. Rawlinson, and executed under his supervision during the cotton famine, are permanently ventilated, the *Lancet* says, by openings at regular distances in the roadways. After inquiries made at West Derby, Bootle, Toxteth Park, and Wavertree, Mr. Rawlinson only consented to recommend the sanction of the Home Secretary to the loans proposed for new sewers on condition that the existing dumb shafts were uncovered and continuously ventilated, and that all the new sewers should be permanently and freely ventilated at the surface of the roadway. The same provision has also been insisted upon for the main sewers now in course of execution at Brighton. That such ventilation is not universal is chiefly due to the prejudices of town councillors and local boards, who obstinately resist the engineer's proposal of ventilation. It may, therefore, be stated that the opinion of the late Mr. Newlands, of Liverpool, against general ventilation, was quite exceptional, and that the mass of professional evidence is entirely in its favour.

LAND AND BUILDING SOCIETIES.

THE FRIENDLY AND BENEFIT BUILDING SOCIETIES' COMMISSION.—The first report of the Commissioners appointed to inquire into the operation of the Acts relating to Friendly Societies and Benefit Building Societies has just been issued. It states that they have examined sixty-six witnesses, including three principal officers of the Registrar's office in London—Mr. A. K. Stephenson, Registrar of Friendly Societies for England; Mr. E. W. Braubrook, Assistant-Registrar; and Mr. Henry Tompkins, Chief Clerk at the Registrar's office; the officers of the two largest affiliated friendly societies; gentlemen connected with two large county societies; several actuaries of eminence; a group of witnesses connected with burial societies of different types; a still larger group of officers of societies and other persons connected with benefit building societies; and gentlemen representing working men's clubs and institutes. Amongst the witnesses thus referred to were Mr. Thomas Dawson, the president; Mr. Thomas Fatkin, the secretary; and Mr. J. W. Middleton, one of the solicitors of the Leeds Permanent Benefit Building Society. Evidence as to the organisation and operations of the society were given by Mr. Dawson and Mr. Fatkin, while Mr. Middleton was examined with reference to the present state of the law in connection with building societies, and he offered suggestions for its alteration in certain particulars. The Commissioners state that the numerous communications received from all parts of the country, some pressing evidence upon them, and others containing complaints of different descriptions or urging the need of local inquiry, had shown to them the wide-spread interest taken in the subject of their investigation. They reserve for the present their conclusions.

COLCHESTER CO-OPERATIVE PERMANENT BENEFIT BUILDING SOCIETY.—This society held its second annual meeting on Monday week last. A very satisfactory report had been issued some days previously, which was unanimously adopted, the general statement showing—Liabilities: Subscribed capital, £744 2s. 6d.; deposits, £162 5s.; interest due to depositors, £6 15s. 6d.; year's salary to secretary, £5; shareholders' profits, £21 12s.; reserve fund, £2 18s. 10d.; total, £942 13s. 10d. Assets: By building advances (less re-payments), £789 8s. 6d.; cash at Messrs. Mills, Bawtree, & Co.'s Bank, £152 6s. 3d.; in secretary's hands, 4s. 1d.; total, £942 13s. 10d. The interest paid has been 4 per cent. from the commencement of the society. Some members of the management committee and the officers having been elected, the proceedings concluded.

ECCLESIASTICAL DILAPIDATIONS.—The new Ecclesiastical Dilapidations Act, commented on at p. 171 of the present number, came into operation on Friday, the 1st inst., and the fees and charges under the Act, which are payable to surveyor, bishop's secretary, and diocesan registrar, are to be fixed on or before the 1st of November next. The persons who are to elect the surveyor or surveyors—for more than one may be appointed in each diocese if thought necessary—and who are to determine upon the fees and charges of all three officers, are the bishop, the archdeacons, the chancellor, and the rural deans.

STAINED GLASS.

MERCHANT TAYLORS' HALL.—A corridor has recently been constructed on the south side of this hall, under the direction of Mr. E. P. Anson, the architect to the Company, for the purpose of affording a communication between the eastern and western portions of the Company's buildings. The corridor is about 112ft. long and 7ft. 6in. wide, and has a range of twenty-five richly-traceried windows in the two eastern bays. For these windows designs have been provided by Mr. T. M. Allen and Mr. Metcalfe, the execution being entrusted to Messrs. Heaton, Butler, & Bayne. Three of the windows are occupied with reference to the famous quarrel between the Merchant Taylors' and the Skinners' Companies. In one is given a representation of a civic procession in which the two companies appear to be struggling for precedence. Another shows the Lord Mayor and Aldermen, to whom the dispute was referred by the Court of Queen's Bench in 1483, giving their decision, which was to the effect that the two companies should take precedence of each other alternately, except either claimed the Lord Mayor of the year, in which case that one should take the lead. To cement the friendship between the two parties, it was further decided that each should dine at the other's hall twice a year. The third window shows one of these banquets in progress. The other decorations of the corridors are of the most elegant and artistic character.

Our Office Table.

PROPOSED REMOVAL OF CITY CHURCHES.—A scheme has been proposed for the removal of the church of S. Martin Outwich (under Bishop Tait's Act), which stands at the junction of Threadneedle-street and Bishopsgate-street, the parish to be united with that of S. Helen's, Bishopsgate. The church of S. Antholin, Watling-street, is an unsightly structure, and is to be removed with a view to the parish being amalgamated with that of S. Mary, Aldermanbury. S. Mildred's, Poultry, which has scarcely any resident population, is also to be taken down, and the parish to be united with that of S. Olave, Jewry.

THE NEW LEEDS BRIDGE.—An unexpected difficulty has arisen in connection with the works for the new bridge. On the south side of the river (says the *Leeds Mercury*) one of the coffer dams has been constructed. On pumping being commenced for the purpose of clearing the dam of water and preparing for the foundation-stone of the new abutment, it was discovered that the supply of water was equal to the pumping power. This led to an investigation and the discovery that the shops adjoining rested upon timber piles, and that the river flowed partially beneath the buildings. As fast as the water was pumped out of the dam the water under the buildings made its way in, and it seemed not improbable that, had the pumping operations been continued, the gravel and soil would be disturbed, and the safety of the buildings be thereby jeopardised. Under these circumstances, it has become necessary for the Corporation to acquire a portion of the property.

THE ENCROACHMENTS OF FATHER NEPTUNE.—Probably few persons are aware of the extent of the encroachments made by the sea upon the east coast of Yorkshire. The Rev. F. O. Morris has calculated that there is an average loss of two or three yards of land every year, and that in round numbers about 39 acres disappear annually between Spurn Point and Flamborough Head alone. Assuming that the rate of encroachment has been stationary, this would represent a loss of 3,900 acres in a century, and calculating the value at £30 an acre, there must have been a waste of something like £700,000 in the interval since the Conquest. But in his calculations Mr. Morris hardly allows sufficient value for the buildings destroyed. Ravenspurn was once an important seaport, and returned a member to the Parliament of Edward I., but when Bolinbroke landed there in 1399 it was little more than a name, and by the end of the next century had wholly disappeared. Auburn, Hartburn, and Hyde are villages which exist only in old maps and documents; and Kilnsea, which lost its church in 1826, seems likely soon to follow the fate of its neighbours. Mr. Morris states his belief that a sea wall laid at an angle of about 35° would arrest the progress of the encroachment, but then no one seems to know whose duty it is to protect our shores from this enemy.

THE NEW SCHOOL BUILDINGS AT HARROW.—“A Lover of Art,” writing to the *Harrow Gazette*, says:—“The extent of the contemplated new school buildings will be such as to command the services of the most talented architect of the day. I trust, therefore, that so good an opportunity of per-

manently beautifying Harrow will not be lost for the sake of any private influence. The name of Mr. Gilbert Scott, R.A., would naturally suggest itself to the majority of the subscribers to the Lyon Memorial Fund, from the beautiful works already existing at Harrow from his designs, and from his world-wide and well-deserved reputation. For Harrow, I have no doubt he would devote his best energies and personal superintendence, notwithstanding the great pressure on his valuable time. Should he, however, be thought to have too much on his hands, there is still a Street or a Waterhouse to resort to.”

A HOUSE REMOVED BY THOMSON'S ROAD STEAMER.—A large frame building, situated in Channel-street, Stockton, California, was lately removed from one part of the town to another by one of Thomson's road steamers. The house is 25ft. by 45ft., and is constructed of very strong and heavy material. It was hauled about ten blocks in distance, part of the way along smooth gravelled streets, and a short distance over uneven streets. The road steamer moved along about as fast as a person could easily walk. The time occupied in the removal was exactly three quarters of an hour. The building, which it is computed weighed not less than thirty tons, was taken round sharp corners without the slightest difficulty, and landed in its position with the utmost precision, and without any difficulty whatever. This is both a speedy and economical method of house-moving.

CARPETS MADE FROM WOOD.—The *Scientific American* thus describes the new kind of carpet, the use of which is said to be rapidly on the increase in America. They are made of small squares of wood, or of more ornamental shape, which are glued on to a stout cloth. The pieces of wood are of different colours, and are placed together so as to produce all the effects of a mosaic work, and as they are about a quarter of an inch thick, they last several years. They are put together with great nicety, so that the joints are perfect as a piece of cabinet work, and the whole is then varnished. The surface can then be polished, rubbed, washed, and even oiled, like inlaid floors, which these carpets, in fact, exactly resemble.

ARTISAN SOLDIERS IN GERMANY.—The *Dresdener Journal* of the 25th ult. publishes the following statement:—“The building of the new Houses of Parliament in Berlin continues in full swing. The masons employed on the buildings up to the 24th ult. have been paid off and dismissed. Company upon company of soldiers, 120 strong, who are all masons, took up the work, and will accomplish it, so that the Imperial Parliament will be able to hold its sittings there in October. The soldiers marched up in full uniform with their arms, piled arms in front of the buildings, and pulled off their uniforms and put on their working jackets to begin operations. The masons employed on the Government buildings have everywhere been dismissed, for fear of future inconvenience in the delay of their completion. At present soldiers have only been employed on the Houses of Parliament. They receive 3s. per diem, the time of work not being limited. At night they are relieved by an equal number of their comrades. The public have no sympathy for the masons on strike.”

LONDON CHURCHYARDS.—The vestry of S. George's Southwark, have just decided to lay out the churchyard with gravel walks, planting it with flowers, and providing seats. It appears that the churchyard, which has for some time been disused, is about an acre and an half in extent, and almost as large as Camberwell-green, and it is urged that as it is in a disgraceful condition, it would be a great boon to the parishioners were it put into decent order and thrown open as a recreation ground. A memorial against the proposal has been presented by some of the inhabitants, objecting that were the churchyard thrown open as proposed, thieves would be able to obtain easy access to the premises, and it was also opposed by certain members of the Vestry; but it was urged in favour of the proposal that in various parishes in the metropolis they were planting and laying out the churchyards for the purposes contemplated, and that it might be taken for granted that the local authorities would soon be compelled to turn these places to some useful account, as London greatly needed such open spaces. A communication was also read from the Holborn Board of Works drawing attention to the churchyards in the metropolis at present closed, and suggesting that the parish should co-operate with them and other boards in urging the Metropolitan Board of Works to take the necessary steps to have the several churchyards in the metropolis thrown open to the public for recreation purposes. The proposal to convert the churchyard of S. George's was carried almost unani-

mously, and the consent of the rector, which was necessary, having been obtained, the conversion is at once to be proceeded with.

FOUR HUNDRED NAVVIES WITHOUT PUBLIC HOUSES.—The *Newcastle Daily Chronicle*, in reporting a visit of the directors of the Newcastle and Gateshead Water Company to the waterworks being constructed at the new reservoir at Hailington, Northumberland, says: “In the construction of the works there have been employed from 300 to 400 navvies, for whose accommodation huts have been erected in the neighbourhood by the company, and instead of having recourse to the ‘truck’ system, as is usual in such works in outlying districts, the directors have paid all the workmen in cash. At the same time, they allowed a store to be established on an independent basis, with a guarantee that the goods supplied should be equal in quality and cheapness to those to be got in the nearest market town. They have not permitted any public-houses to be erected or liquor to be sold, and the result has been that during the progress of the works there has not been one charge of theft or the slightest semblance of disturbance. Two members of the Northumberland police force have been stationed at the place, but their duties have happily been a sinecure.”

BIRMINGHAM SCHOOL OF ART.—The Birmingham School of Art has re-opened for the autumn session, and several additional classes have been commenced, under the superintendence of Mr. S. P. Fraser, whose services the Committee have obtained. Mr. Fraser holds high certificates from the Department, and is a successful exhibitor at the Royal Academy. The study of the living figure and costume has not hitherto been obtainable by the ordinary students of the school, and it is therefore with pleasure that we find a class for the study of these subjects is to be commenced. The committee have been at considerable trouble and expense in making the necessary arrangements for the classes, and have succeeded in obtaining, for the comfort of the students, further accommodation, by renting the large Museum Room at the Queen's College.

THE PROPOSED ENLARGEMENT OF BRIXTON PRISON.—A determined opposition to the above proposal, which involves the enlargement of Brixton Prison to the extent of holding over a thousand military convicts in addition to the number of prisoners it can at present contain, is being organised. A series of public meetings will be held in South London, almost immediately, to discuss the subject, and to devise the best means of bringing pressure to bear on the Government to alter their determination, on the ground that if carried out it will seriously affect the value of land and house property in Brixton proper, and exercise a deteriorating influence upon the surrounding districts, by planting in their midst a colony of convicts. The members for Lambeth—Sir James Clarke Lawrence, Bart., and Mr. McArthur—who last session opposed the vote of £31,000 for the proposed prison enlargement, will be invited to attend the meetings, and generally co-operate with the local committees in the course of formation.

OPENING OF THE TRAMWAYS BETWEEN GREENWICH AND BLACKFRIARS.—The cars travelled for the first time on Wednesday last on the above line, which opens up direct communication between East Greenwich, Blackheath, and Blackfriars. The first car left East Greenwich at eight, and continued to leave every ten minutes throughout the day until 10.10 p.m. On Sundays the cars will commence running at 9 a.m., and continue until 9.40 p.m. From Blackheath-hill the first car left on Wednesday at 8.8 a.m., and will continue to start every twenty minutes until 12 p.m. Passengers from Blackheath-hill change cars at Deptford-bridge Junction. The first car left Blackfriars-bridge on Wednesday at 9.4 a.m., and will continue to run to Greenwich and Blackheath every ten minutes throughout the day until 11.14 p.m.

TEMPORARY CLOSING OF KING'S COLLEGE HOSPITAL.—King's College Hospital is now undergoing the process of a thorough cleansing, painting, and re-decorating throughout all the wards. In consequence of this the board of governors have decided to close the hospital until the 16th inst., so far as the admission of fresh out-patients is concerned. All accidents and urgent cases, however, will be admitted as usual.

An extensive range of black sheds, near the saw-mills of the Royal Arsenal, Woolwich, and used as workshops and stores for seasoning timber, are about to be removed, and replaced by a large smithery, which when complete will probably be the largest and most complete smiths' shop in the world.

Chips.

A French engineer, writing to the *Siecle*, says that as the problem of cutting through mountains has been solved by the Mont Cenis tunnel, there is nothing to prevent a railway being made from Paris to Peking. The cost of the great tunnels would be only £8,800,000.

The design for the seal of the London School Board is somewhat amusing. On it is a rather hard-faced angel, who is receiving two children; one bearing flowers, the other a copy of—in real truth—a copy of the *Echo*. We wonder how much the advertisement cost the proprietors.—*South London Press*.

A surveyor will shortly be appointed for the diocese of Bath and Wells, under the Ecclesiastical Dilapidations' Act, 1871. Applications for the appointment are invited.

A fine art exhibition at Bebington, near Birkenhead, was opened on Saturday last.

New schools, in connection with S. George's Church, Middle-street, Deal, were opened on Wednesday week.

New moulding and planing machinery, by Messrs. S. W. Worsam & Co., of Chelsea, has been fitted up on the premises of Messrs. Holmes, timber merchants, Bath.

The Mersey Docks and Harbour Board have commenced the works for the construction of new approaches from the docks to the Mersey, from plans by Mr. G. F. Lyster, the dock engineer.

A new poultry hall was opened at Oakham a few days ago.

Operations were last week commenced at Mid-Calder by Mr. Francis Lawrie, slater, for the erection of a Town Hall. The building, when finished, will have a handsome and commodious appearance.

It is proposed to build a new church at Bromsgrove.

It has been resolved by the inhabitants of Millbrook to erect a new parish church on a site presented by Lady Barker Mill, and to restore the existing church as a chapel-of-ease for the parish.

It is stated that the Belgian Council of Ministers have resolved to lay before the King proposals for a Universal Exhibition, to be held in Brussels in 1874.

The tower of Stowmarket parish church has, it is said, been affected by the late gun cotton explosion, although it is a very massive piece of masonry. The windows of the church are in course of reconstruction.

The citadel of Ghent, which was commenced in 1822 and completed in 1830, is now in course of demolition.

A new Roman Catholic chapel was opened at Newton Abbot on Tuesday week. It cost £400, Mr. J. W. Rowell being the architect.

Whatever the merits of Edinburgh may be, says the *Pall Mall Gazette*, it is certainly not a clean city; indeed, it would be hardly possible to find, in some respects, a dirtier one.

The Sanitary Committee of the Bradford Corporation has decided to recommend the Town Council to adopt Gaux's system of earth closets.

A fish and market stand is being provided at Falmouth.

The pier at Penzance has been widened and strengthened. The work was commenced in May, 1870, and the contract price for it was £4,440.

A deputation of Her Majesty's Commissioners for the Exhibition of 1851 will visit Manchester on the 12th inst., for the purpose of conferring with the chief Magistrates, the Chamber of Commerce, and the other local authorities of Manchester and the neighbourhood, on the subject of the representation of the cotton manufactures in the Exhibition next year.

Another serious landslide has occurred near Northwich, in Cheshire, on a foot road, and about 20 yards deep. It is believed to be on the site of the first salt mine sunk in the county.

Plans for the extension of the infirmary at Forfar are under consideration.

It is proposed to erect a large swimming bath in Nairn, adjoining the beach. The plans provide a covered bath of 100ft. by 40ft.—the sea water to flow off and on every tide. The probable cost is £1,200.

A new theatre was opened at Reading on Monday last, under the management of Mr. Elliot Galer.

S. John's National Schools, in Scotgate, Stamford, are about to be enlarged, at a cost of £600.

The new Church of S. Thomas, Pond's Bridge, Whitlesey, will be consecrated by the Bishop of Ely on the 14th inst.

The first stone of a chapel in connection with the Diocesan Training School was laid by Mrs. Wordsworth, at Lincoln, on the afternoon of the 24th ult. Messrs. Otter & Elsey, Lincoln, are the contractors for the building.

More than £11,000 has already been raised of the £50,000 required for the restoration of S. Alban's Abbey.

In addition to the extensive alterations now in progress at Pembroke College, Cambridge, the Society of King's have decided to add a building on the northern side of their college. Twelve sets of rooms will be added to the college accommodation.

The two great tunnels on the New York and Oswego Railroad, in Sullivan County, are nearly completed. At the Shewangunk Mountain tunnel only 600ft. intervene between the working parties. It is expected that it will be finished by December 1st. The other tunnel, at Fallsburgh, will be completed in about a month.

Steps are being taken for the erection of a Town-hall at Lydney, Herefordshire.

The question of the restoration of the column of the Place Vendôme is much complicated by the fact that the metal of which the bronze art incrustation was composed, has been found so thin that the sculptures have been hopelessly injured by the concussion of the crash of the fall of the column to the ground. The probability is that the column will never be restored.

New Sunday Schools for the Primitive Methodists have been erected at Esten, Yorkshire.

The original scheme for building a public hall for Harrow having fallen to the ground, it is proposed to build a hall in connection with the King's Head Hotel, which is about to be rebuilt. The proposed expenditure for the hall is £6,000.

Arrangements are in progress for the erection of a new townhall at Leslie, Fifeshire, and it is expected that building operations will shortly be proceeded with.

Money is being raised for the erection of a new church at New Town, Cliftonville, Margate.

In consequence of the great increase of the traffic on the North London Railway between Broad-street Station and Dalston, an additional line of rails is about to be laid down, making the series of four lines uniform throughout. Mr. John Jay has undertaken the contract.

Neenton parish church, near Bridgnorth, has just been re-opened, after having been entirely rebuilt, the old structure having become so dilapidated as to necessitate its demolition.

A lighthouse is about to be erected on Turnberry Point, Ayrshire, on the site of the ancient castle of King Robert Bruce.

PERSONAL.

Mr. Bowes A. Paice, architect, is a candidate for the Ecclesiastical Surveyorship for the diocese of London.

The Rev. D. Silvan Evans, B.D., rector of Llany-mawddwy, Merionethshire, has been appointed to succeed the late Rev. H. Longueville Jones as editor of the *Archæologia Cambrensis*, the journal of the Cambrian Archæological Association.

Mr. T. Hawksley, C.E., has arrived in Birmingham, and met two or three of the members of the Sewage Inquiry Committee, his services having been engaged by the committee to report on the engineering aspects of the scheme which, it is understood, is under investigation.

Mr. Albert W. Parry, Chief Assistant to the Borough Surveyor, Bradford, was last week appointed Surveyor to the Reading Local Board of Health. There were 105 candidates for the office, from which the Drainage Committee selected the following four from whom to make the final selection:—Mr. E. Pritchard, C.E., Borough Surveyor, Warwick; Mr. E. Lynam, Borough Surveyor, Wakefield; Mr. R. Vawser, C.E., Surveyor to the Warrington Local Board of Health; and the successful candidate, Mr. A. W. Parry.

Dr. Lankester, the coroner for Central Middlesex, held an inquest on Monday evening last on the body of Mr. John Moore, aged 32, a sculptor and wood carver, who committed suicide by hanging. It is believed that the deceased's brain was affected from over-study. The jury returned a verdict to the effect that deceased destroyed himself while in an unsound state of mind.

The Earl of Shaftesbury laid the foundation-stone of a new Convalescent Home for Glasgow on Monday afternoon. The estimated cost of the new building is £50,000.

Mr. Edwin Chadwick, C.B., has issued a paper upon the precautions to be taken against the cholera, in which he unfavourably contrasts the action taken by the existing sanitary authority with that adopted some years ago by the Board of Health, of which he was a member.

Mr. Richard Ratcliff and Mr. Robert Ratcliff (of the firm of Bass, Ratcliff, & Grettton) have offered to erect public baths and wash-houses in Burton-upon-Trent, and present the same to the town. The estimated outlay is £5,000.

Lord Shaftesbury laid the foundation-stone of the Field Free Church, Glasgow, on Wednesday week.

Mr. George Fox, a well-known Yorkshire antiquary, and author of a "History of Pontefract," died at Pontefract on Wednesday week, aged sixty-nine years.

Professor Vogeli has just made a discovery of great interest to all lovers of the fine arts. While engaged in examining the public library at Zurich, he found a table-top painted by the celebrated Holbein—a piece of work long believed to have been lost.

Mr. W. P. Frith, R.A., has just been elected a member of the Royal Academy of Belgium.

The Right Hon. A. S. Ayrton, M.P., Chief Commissioner of Works, last week visited Southampton, for the purpose of making an official private inquiry into particularities connected with the Ordnance Survey for the information of a Parliamentary commission. The right hon. gentleman's visit lasted from Monday till Wednesday.

Timber Trade Review.

PRICES, SEPTEMBER 5.—Dantzic crown deck deals per 40ft. 3in., 17s. 6d. to 21s.; brack, 11s. 6d. to 16s.—Flooring boards per square of lin.: Best yellow, 9s. 6d. to 10s. 6d.; white wood, 8s. 6d. to 9s.; second qualities, 6s. to 8s. 6d.; matched, boards per square 4in. and 4in., 5s. to 8s.—Lath-wood per cubic fathom: Petersburg, £5 5s. to £6; Riga, Dantzic, Memel, and Swedish, £3 to £5.—Oak timber per load of 50 cubic feet: Memel crown, £5 10s. to £6 10s.; ditto brack, £4 15s. to £5; Dantzic crown, £5 to £6; ditto brack and unseasoned, £4 to £4 5s.—Wainscot per 18ft. cube, Riga crown (English and Dutch), £4 to £5; ditto brack, £3 to £3 5s.; Memel and Dantzic crown, £3 15s. to £4; ditto brack, £2 to £2 8s.—Firewood per cubic fathom: Swedish deal ends, £4 5s. to £4 15s.; Norway red and white boards, £3 5s. to £4; round and slabs, £2 10s. to £3.—Deals and battens per Petersburg standard: Archangel best yellow, £12 10s. to £14 10s.; ditto second yellow, £9 10s. to £10; Petersburg yellow, £13 to £13 10s.; Wyburg yellow, £10 to £10 10s.; Swedish and Gothenburg (good stocks), £10 to £10 10s.; ditto common and thirds, £8 10s. to £9 10s.; Gelfe and best Swedish deals, £10 10s. to £12 10s.; Swedish battens, £8 to £9 10s.; best bright pine, £18 to £19 10s.; ditto seconds, £13 5s. to £13 10s.; ditto thirds, £9 to £9 5s.—Pir timber per load of 50 cubic feet: Riga, £3 5s. to £3 7s.; Dantzic and Memel crown, £4 to £4 10s.; ditto best middling, £3 5s. to £3 15s.; ditto good middling and seconds, £3 to £3 5s.; ditto common middling, £2 10s. to £2 15s.; ditto undersized, £2 10s. to £2 15s.; ditto small, short, and irregular, £2 to £2 10s.; Stettin, £2 10s. to £2 15s.; Swedish, £2 5s. to £2 15s.; ditto small, £2 to £2 5s.; Swedish and Norway balks, £3 13s. to £3 18s.

Trade News.

WAGES MOVEMENT.

BARNSELY.—The bricklayers and labourers of Barnsley have, during the week, served a notice upon their employers to cease work at twelve o'clock on Saturdays instead of four. A meeting of the masters has been called to consider the notice. The hours at present worked per week are 52½, and the present application would have the effect of reducing the working hours to 42½.

THE WAKEFIELD MASONS.—The masons of Wakefield, who now work 52½ hours a week and leave off at four o'clock on Saturday, are now on strike for a reduction of hours, wishing to leave at twelve o'clock.

TENDERS.

BUCKS.—For additions, &c., to national schools at Woodburn-town. Mr. Arthur Vernon, architect:—

Corby..... £446 0 0
Banghurst (accepted)..... 433 13 2

GUILDFORD.—For detached house in the Waterden-road, Guildford. Mr. Henry Peak, architect:—

Loe..... £1163 0
Strudwick..... 1072 8
Mason..... 1059 10
Pearce & Clark (accepted)..... 998 16

FOLKESTONE.—For a roof-screen in wrought iron and brasswork, to be erected in S. Peter's Church, Folkestone. Mr. S. Slingby Stallwood, architect, Folkestone:—

Richardson, Slade, & Co..... £220
Hart, Son, Peard, & Co..... 164
F. O. & W. Francis..... 124

GUILDFORD.—For pair of small houses on the Waterden estate, Guildford. Mr. Henry Peak, architect:—

Strudwick..... £768 0
Garnett..... 767 0
Mason..... 759 5
Loe (accepted)..... 697 0
Bristow & Burdett (withdrawn)..... 559 0

LONDON.—For alterations and repairs, No. 13, Duke-street, Portland-place. Mr. James Harrison, architect. Quantities supplied by Mr. A. W. Q. Nicoll:—

Parks..... £425
Stephens..... 405
Mashman..... 377
Watson Brothers (accepted)..... 357

LONDON.—For new laundry buildings at Bethnal House Asylum. Messrs. Tolley & Dale, architects:—

	Old materials.	
Forrest.....	£1574	£80
Conder.....	1509	18
Wicks, Bangs, & Co.....	1507	60
Smith.....	1500	53
Kilby.....	1420	12
Pritchard (accepted).....	1423	28

LONDON.—For new laundry buildings at Grove Hall Asylum, for E. H. Byas, Esq. Messrs. Tolley & Dale, architects:—

Wicks, Bangs, & Co. (accepted)..... £955

CONTRACTS OPEN FOR BUILDING ESTIMATES.

STOCKPORT UNION, September 28.—For the supply of nine iron bedsteads, and four invalid bedsteads, with rackheads.—F. W. Johnson, Clerk to the Union, Union Offices, Stockport.

KILKENNY, October 2.—For the removal of the present S. John's bridge, over the River Nore, and erecting a new bridge, consisting of three cast-iron arches, about 40ft. span each, on stone piers and abutments.—Peter Burchell, Esq., County Surveyor, County Surveyor's Offices, Court House, Kilkenny.

WESTMINSTER UNION, September 15.—For the erection of infirmary offices and new wing to the Union School, Wandsworth-common.—W. B. West, Clerk, Board-room, Marshall-street, Golden-square.

WHITECHAPEL CHARITY ESTATES, September 12.—For rebuilding Nos. 22 to 27, Princes-street, and others in Bell-court, at the rear.—H. S. Mitchell, Vestry Clerk's Offices, 5, Great Prescott-street, Whitechapel.

TUNBRIDGE WELLS, September 15.—For the construction of about 600 feet of 4 feet by 4 feet brick sewer, with manholes, screening chamber, and other works.—Thomas Lewis, Clerk to the Local Board, Town Hall, Tunbridge Wells.

WAR DEPARTMENT CONTRACTS, September 21.—For the erection of additional married soldiers' quarters for the South Cavalry Barracks, at Aldershot.—Royal Engineer Office, Aldershot.

LEEDS, September 22.—For the erection of certain premises, with cottages and stabling, in Whitehall-road.—Hill and Swan, architects, Leeds and Sheffield.

WORCESTER.—In Chancery: Attorney-General v. S. David's, October 31.—For taking down and rebuilding S. Oswald's and Hame's Hospitals, Worcester.—Alfred Rawlinson, Chief Clerk; Cree and Last, 13, Gray's Inn-square, London, Relator's Solicitors.

BIRMINGHAM, September 18.—For painting, paper-hanging, colouring, &c., at the Parish Offices.—William Thompson, Clerk to the Guardians, Parish Offices, Paradise-street.

BOARD OF WORKS FOR THE LINEHOUSE DISTRICT, September 18.—For watering the roads and streets, for scavengers' work, and for the removal of dust.—Thomas W. Ratcliff, Clerk of the Board.

METROPOLITAN BOARD OF WORKS, September 29.—For the construction of a brick sewer and the formation of carriageway and footways, with other works along the new street near Seymour-place, Upper York-place, Marylebone-road.—John Pollard, Clerk of the Board, Spring-gardens, S.W.

LEITH HARBOUR, September 18.—For the hydraulic machinery and apparatus of an iron swing bridge at Leith Harbour, to span 120 feet of waterway.—John Plin, Clerk to the Commission, 13, Heriot-row, Edinburgh.

ATCHAM UNION, September 21.—For alterations and additions to the Union Workhouse.—Joseph Everest, Clerk to the Guardians, Union Offices, S. John's Hill, Shrewsbury.

DUNDEE HARBOUR, September 23.—For the completion of Victoria Dock, the construction of a graving dock, and other works.—David Cunningham, Harbour Engineer, Works Office, Harbour Chambers, Dundee.

CRYSTAL PALACE PARK ESTATE, September 16.—For the erection of a villa residence on Plot 16, close to the Sydenham entrance to this estate.—John Norton, Esq., architect, 24, Old Bond-street, W.

CHEPSTOW, September 16.—For the enlargement and alteration of Hardwick House, near Chepstow.—Charles F. Hansom, Architect, 5, Arlington-villas, Clifton.

GREAT WESTERN RAILWAY COMPANY, September 12.—For the supply of Quebec yellow pine, converted into longitudinals, transoms, planks, and other scantlings.—Fred. G. Saunders, secretary, Paddington Station, London.

BATH AND OTHER BUILDING STONES, OF BEST QUALITY.

RANDELL, SAUNDERS & CO., Limited, Quarrymen and Stone Merchants.

List of prices at the Quarries and Depôts, also cost of transit to any part of the United Kingdom, furnished on application to

BATH STONE OFFICE:
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TO ARCHITECTS.

GREEN ROOFING-SLATES.

As supplied to H.R.H. The Prince of Wales at Sandringham. The Penmoye Sea-green Slates are specially adapted for Churches, Public Buildings, &c., &c.

(Less costly than ordinary Gothic Tiling.)

These durable and non-absorbent Slates can be obtained in sizes suitable for Gothic Architecture, at prices as under.

In Railway Trucks, Docks, Gloucester:—		Per Equivalent to 1200 Slates, per square
Best Green Slates 14 by 7 ...	2 17 6	16s. 6d.
Do. do. 13 by 8 ...	2 17 6	16s. 6d.
Do. do. 13 by 7 ...	2 5 0	14s.
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Do. do. 12 by 6 ...	1 7 6	11s.

Prices of large Sizes, Cost of Transit, Reference Testimonials, and Sample Specimens may be obtained on application to

MESSRS. RANDELL & CO., Corsham, Wilts.

Specimens at Museum of Geology, Jernyn-street, Piccadilly, W., and at Architectural Museum, Tufon-street, Westminster.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.

LEAD.

Pig—Foreign	per ton	£17 10 0	£17 12 6
" English W.B.	do	20 5 0	20 10 0
" Lead Co.	do	18 10 0	18 15 0
" Other brands	do	18 0 0	18 5 0
Sheet Milled	do	18 5 0	0 0 0
Shot, Patent	do	20 10 0	0 0 0
Red or minium	do	20 10 0	0 0 0
Litharge W.B.	do	0 0 0	0 0 0
White Dry	do	25 10 0	26 0 0
" ground in oil	do	0 0 0	0 0 0

COPPER.

British—Coke & Ingot	per ton	74 0 0	76 0 0
Best Selected	do	76 0 0	78 0 0
Sheet	do	75 0 0	81 0 0
Bottoms	do	81 0 0	83 0 0
Australian	do	75 0 0	78 0 0
Spanish Coke	do	68 0 0	70 0 0
Chili Bars, cash	do	66 10 0	68 10 0
" Refined ingot	do	76 0 0	0 0 0
Yellow Metal	per lb.	0 0 6½	0 0 7½

IRON.

Pig in Scotland, cash	per ton	3 2 6	0 0 0
Welsh Bar, in London	do	7 10 0	7 12 6
" " Wales	do	6 15 0	6 17 6
Staffordshire	do	8 5 0	8 15 0
Rail, in Wales	do	6 15 0	7 0 0
Sheets, single in London	do	9 15 0	10 15 0
Hoops, first quality	do	9 0 0	9 15 0
Nail Rod	do	8 5 0	8 10 0
Swedish	do	9 15 0	10 0 0

OILS, &c.

Seal, pale	per tun	33 0 0	0 0 0
Sperm body	"	80 0 0	81 0 0
Cod	"	34 10 0	0 0 0
Whale, South Sea, pale	"	33 0 0	33 10 0
Olive, Gallipoli	"	51 0 0	52 0 0
Cocconut, Cochin, tun	"	51 0 0	0 0 0
Palm, fine	"	37 0 0	0 0 0
Linseed	"	33 0 0	0 0 0
Rapeseed, Eng. pale	"	41 0 0	0 0 0
Cottonseed	"	29 10 0	35 10 0

TIMBER.

Teak	load	12 5 0	13 10 0
Quebec, red pine	"	3 15 0	4 15 0
" yellow pine	"	4 5 0	5 5 0
Quebec oak, white	"	6 0 0	6 5 0
" birch	"	3 10 0	4 10 0
" elm	"	3 10 0	4 0 0
Dantzic oak	"	4 10 0	6 10 0
" fir	"	2 7 0	4 0 0
Memel fir	"	2 15 0	3 0 0
Riga	"	3 5 0	3 10 0
Swedish	"	2 0 0	2 10 0
Masts, Quebec red pine	"	4 0 0	6 10 0
" yellow pine	"	4 0 0	6 10 0
Oregon	"	7 0 0	10 0 0
Lathwood, Dantzic, fm.	"	3 0 0	4 10 0
St. Petersburg Deals, per C, 12ft. by 3 by 9in.	"	4 15 0	5 15 0
Quebec, white spruce	"	12 10 0	13 10 0
St. John, white spruce	"	12 10 0	14 0 0
Yellow pine, pr reduced C	"	18 0 0	19 10 0
Canada, 1st quality	"	12 5 0	13 10 0
" 2nd do	"	12 10 0	14 0 0
Archangel, yellow	"	12 10 0	13 10 0
St. Petersburg, yellow	"	13 0 0	13 10 0
Finland	"	7 10 0	8 0 0
Memel and Dantzic	"	0 0 0	0 0 0
Gothenburg, yellow	"	8 10 0	10 10 0
" white	"	8 10 0	9 0 0
Geffe, yellow	"	10 10 0	12 10 0
Soderham	"	8 10 0	12 0 0
Christiania, per C, 12ft. by 3 by 9in., yellow	"	10 0 0	12 10 0
Other Norway	"	7 0 0	8 0 0
Flooring boards, pr square of lin., first yellow	"	0 9 0	0 10 0
First white	"	0 8 0	0 9 0
Second qualities	"	0 6 0	0 8 0

BANKRUPTS.

TO SURRENDER IN THE COUNTRY.

Simmons, David, Charlton Kings, builder, September 12, at Cheltenham.

PUBLIC EXAMINATIONS.

November 3, A. Canston, Walthamstow and Pentonville-road, Islington, surveyor.

DIVIDEND MEETING.

September 27, S. Cochran and J. Parker, Chorlton-upon-Medlock, builders.

DECLARATIONS OF DIVIDENDS.

G. Webster, Stockton-on-Tees, builder, div. 2s.—G. Hunter, East Dereham, engineer, div. 3s. 3d.

SCOTCH SEQUESTRATION.

Robert Wilson, Edinburgh, painter, September 8, at 2.

PARTNERSHIPS DISSOLVED.

Wilkinson, Rollitt, & Wilkinson, Worksop, stone masons and builders—Hope Iron and Tin Company, Tipton—Street & Smith, Ventnor, builders—Eastons, Amos, & Anderson, The Grove, Southwark, and Erith, engineers—Cushin & Green, Gresham House, Old Broad-street, engravers—Simpson & Dakin, Derby, plasterers.

SCHOOL-BOARD FOR LONDON.—To Surveyors, Auctioneers, Estate Agents, and Property owners.—The Schoolboard for London, having in contemplation the erection of Schools within the several Districts mentioned below, are prepared to receive OFFERS of SITES, of not less than a quarter of an acre in area, within such Districts. Offers (on printed Forms, which will be sent on application) containing full particulars, and accompanied by Plans of the Property, to be sent to the Clerk of the Board.

CITY AND TOWER HAMLETS.

A.—A District bounded on the north-west by Bishopsgate-street, on the north-east by Commercial-street, on the south-east by Whitechapel High-street, and on the south-west by Houndsditch.

FINSBURY.

B.—A District bounded on the north by the Regent's Canal, on the east by Caledonian-road, Upper Southampton-street, and Southampton-street, on the south by Pentonville-road, and on the west by York-road.

C.—A District bounded on the north by the Cattle Market, on the east by Caledonian-road, on the south by the North London Railway, and on the west by York-road.

D.—A District bounded on the north-west by Clerkenwell-green and Aylesbury-street, on the east by St. John-street, on the South by Charterhouse-street, and on the west by Farringdon-road.

GREENWICH.

E.—A District bounded on the south, west, and north by the township of Hatcham boundaries, and on the east by London, Brighton, and South-coast Railway.

HACKNEY.

F.—A District bounded on the north by Acton-street, Livermore-road, Shrubland-road, and parts of Lansdowne-road and West-street, on the east by Cambridge-road, on the south by Hackney-road, and on the west by Kingsland-road.

LAMBETH.

G.—A District bounded on the north-east by Kent-street, on the south-east and south by Warner-street, Portland-place, and New Kent-road, and on the north-west by Newington-causeway, Stones'-end, and Blackman-street.

H.—A District bounded on the north-west by Battersea-road, on the east and south by the Crystal Palace Railway, and on the west by Latchmere-road.

MARYLEBONE.

I.—A District bounded on the north-west by St. John's Wood-road, on the north-east by Grove-road, Grove-place, and Lisson-grove North, on the south-east by Marylebone-road, and on the south-west by Edgware-road.

J.—A District bounded on the north by Euston-road, on the east by Tottenham Court-road, on the south by New Cavendish-street, Upper Marylebone-street, and Howland-street, and on the west by Portland-place and Park-crescent.

K.—A District bounded on the north by Cumberland Market and Edward-street, on the east by Hamstead-road, on the south by Euston-road, and on the west by Albany-street.

L.—A District bounded on the north by Crowndale-road, on the north-east by Old St. Pancras-road, on the south by Grenville-street and Aldenham-street, and on the west by Eversholt-street and Seymour-street.

SOUTHWARK.

M.—A District bounded on the north by Spa-road, on the north-east by the South-Eastern Railway, on the east by St. James's-road, on the south by Lynton-road, and on the west by Balaklava-road, part of Alma-road, and Amellia-road.

N.—A District bounded on the north and east by White-street and Long-lane, on the south by Star-corner and Bermondsey New-road, and on the west by Kent-street and the Old Kent-road.

TOWER HAMLETS.

O.—A District bounded on the north by the boundaries of the parish of Stepney, on the east by Globe-road, on the south by Mile End-road, and on the west by Cleveland-street and the boundaries of the parish of Stepney.

P.—A District bounded on the north-west by Whitechapel High-street and road, on the east by Turner-street, and on the south by Commercial-road.

Q.—A District bounded on the north by Mile-end-road, on the east by Johnson's-street, on the south by Bull-lane, and on the west by White Horse-lane.

CHELSEA.

R.—A District bounded on the north by King's-road, on the east by Manor-street, on the south by the Thames, and on the west by Beaufort-street.

WESTMINSTER AND FINSBURY.

S.—A District bounded on the north by Great Queen-street and the northern boundaries of Lincoln's Inn-fields and Lincoln's Inn, on the east by Chancery-lane, on the south by the Strand, and on the west by Drury-lane and Drury-court.

* * The usual Commission will be paid to Agents on the completion of purchases.

Offices of the Board, 33, New Bridge-street, E.C.,
September 6, 1871.

FOR SALE, the entire PLANT of a small GAS-WORK, capable of making 30,000 feet per diem. Canal alongside.—Apply to Mr. Meacock, Norwood Green, Middlesex; or 15 and 16, Giltspur-street, E.C.

AN OPPORTUNITY. — FREEHOLD BRICK, TILE, and POTTERY WORKS for SALE, with residence, and nearly 7 acres of land; an old-established concern. Excellent slays, all in good working order. Well situated about 50 miles from London, close to railway-station, and embracing many local advantages. The present proprietor retiring from the business. —For particulars apply to Messrs. Henry Clayton, Son, & Howlett, Engineers and Manufacturers of Brick and Tile Machinery, Atlas Works, Woodfield-road, Harrow-road, London, W.

THE BUILDING NEWS.

LONDON, FRIDAY, SEPT. 15, 1871.

WHO OVERCROWD THE PROFESSION?

IT is a curious fact that, in spite of the multitude of young men who are constantly seeking employment in architects' offices, there are few things more difficult than to obtain an assistant worthy of the name. It is equally curious that, in spite of the vast array of architects whose names crowd the London Directory, the public should find it no easy matter to get even the simplest building fairly designed. The truth is that architects' assistants are scarce, and qualified architects themselves are scarcer still. To look at our streets, one might fancy there were not a dozen in the kingdom. Even estimating them by the most exhaustive methods—by an examination of executed works all over England, and a constant study of the views which appear in architectural journals—one soon concludes that men of ability must be comparatively few. Many able men there doubtless are who still remain unknown. Unlike the painter or the literary man, the architect cannot do his work regardless of the world's help or hindrance. With him, ideas on paper count for next to nothing; he must put them in brick and stone before they will be regarded, and to do this, he must first make himself believed in by somebody who has capital to lay out in building. Of those architects, then, who as yet are a name and nothing more, we have no opinion to offer. We will hope and believe that some of them, at least, when they emerge from their obscurity, will do credit to their profession. But there are too many for whom such a hope can scarcely exist. They are in practice—have been in practice for years—have had, it may be, excellent opportunities, and have failed to turn them to account. They may be very respectable men, with abundance of good qualities; they are to be pitied, perhaps, rather than blamed, for occupying a totally false position. But the fact remains that though the architectural profession may be overcrowded, it is certainly not overcrowded with architects, who, whether as principals or assistants, are not discoverable in any great plenty, even by all the advertising processes known. The correspondence on this subject which has from time to time appeared in our own columns has chiefly related to the supposed superabundance of assistants. There is undoubtedly a great superabundance of pupils whose term of apprenticeship has expired, and who, from one cause or another, have learned very little. Many of them—who ought in all fairness to have been rejected before their term began—have not the slightest aptitude or preference for the work they have chosen. Others—articled where there was little to be learned—have not had the opportunity of cultivating such talent as they possess. By far the largest part, however, have gone on tranquilly in the notion that the mere process of being articled for four or five years would, in some occult manner, render them masters of their business. They have never investigated or inquired for themselves; they have fallen in with the routine of the office—traced drawings, copied specifications, and coloured plans—and hardly realised, till their time was over, that this, in their particular station, was not the whole duty of man. At the last moment it dawns upon them that the mere act of sitting, with whatever perseverance, at a high desk on a leather-topped school, does not of itself fill the mind with information; and that wood, though it is not a very good conductor of electricity, is a still worse conductor of knowledge. The former failing, indeed, we have known to be compensated by an ingenious arrangement of wires and

tin foil, until the tallest of office perches could not protect a pupil against a moderate-sized Leyden jar; but, unhappily, there is no analogous means of transmitting unsought-for instruction. Even where the very atmosphere is charged with accumulated experience, a careless ear and a regardless eye prove perfect insulators; and so it happens that from some of the best offices in London come some of the most ignorant and useless of assistants.

Instead, however, of confining ourselves to general remarks, we may indicate a few of the types of pupil and assistant which, during the last twenty years, it has been our fortune to notice. A. was amongst the earliest of our architectural acquaintances. He had been articled some three years when we first met him, and had by no means idled away his time. He was earnest in the study of materials, proud of his skill in measuring up work, and enthusiastic on the subject of builders' prices. Without a grain of talent for designing, he soon entered into practice for himself, and by excellent business habits and exemplary energy acquired a considerable connection. B. and C., two friends, were amongst the next we met. One was a junior assistant, the other by turns assistant and clerk of works. Neither of them, probably, ever gave a thought to their business out of office hours, neither of them ever made a sketch or took a note of any kind for his own benefit, and neither of them, fortunately, found it worth his while to remain in the profession. One of them emigrated to South Africa, the other became a wine merchant at the West-end. D., a pupil with whom we were associated about the same time, was a thoroughly good fellow quite out of place. It was his unceasing regret that he was not a farmer, and when his articles expired, he was wise enough to go abroad and follow the occupation he preferred. E., another pupil, was of quite a different sort. His talent, as he gravely asserted, lay in invention. He had already patented a lock worthy of the Laputan college of projectors, of which the peculiarity was that if you inserted by mistake a wrong key, the lock held it fast, and it could never be removed. He was never heard of as an architect, being, as he once informed us in confidence, only able to design, but not to draw. F., his fellow pupil, had a failing in the opposite direction. He was a particularly neat draughtsman, with an extremely small knowledge of architecture, and a still smaller stock of original ideas. He, however, by prudence and perseverance gradually emerged, and in a remote part of the kingdom acquired a small and steady practice amongst the class which, as regards church principles, may be defined as the lowest of the low. G. was the principal assistant in the same country office with E. and F., and his peculiarity was that he could neither design nor draw. He came down from London, he told us, "to work the business." He brought, by way of credentials, a magnificent set of drawing instruments, which no persuasion would ever induce him to handle. No one ever saw him touch a pencil, and it was speedily ascertained in the office that he did know not deals from battens, nor countless slates from duchesses. But Nature had gifted him with an unexceptionable pair of whiskers, he possessed a mild and benignant address, together with an aspect of profound wisdom, and the impression which he made on potential clients was doubtless a sufficient return for his salary. H., whom we were next introduced to in a London office, was a managing clerk of quite another order. He was thoroughly trusted, and deserved to be; he had very fair abilities for design, and had made himself completely conversant with the practical parts of the profession. He was taken into partnership by the architect whom he had served, and to whom he had gradually become indispensable, and having deserved the best position of all those whom we have enumerated, found himself, after no very long

period of waiting, in actual possession of it. We could easily go on with the list, and fill the alphabet twice over, but the sample already given may stand for the rest. If any one thinks that more than one in eight of the junior members of the profession are really qualifying themselves for its higher posts, his experience has been different from ours, and different, we fear, from the average.

VIOLETT LE DUC'S "DICTIONNAIRE RAISONNÉ DE L'ARCHITECTURE FRANÇAISE." *

XII.

HAVING thus completed his historical summary of the history of Mediæval architecture in France, M. le Duc resumes his definitions of the various technical terms employed by the architect. From one of these, the extreme beauty of one of his illustrations induces us to extract both it and much of the letter-press. Under the word *armoire* (the aumbry or locker of our technical language) we find much interesting matter. In French, this word is used in a generic sense to express any kind of cupboard, fixed or movable; but it is at present discussed with reference to the former only, its latter definition being expounded in the author's "Dictionnaire Raisonné du Mobilier Française"—a work, though as yet incomplete, to which on some future occasion we may probably revert. In the restricted sense here adopted, the word is used to designate any inclosed recess in a wall, or a structural cupboard, whether in a domestic or an ecclesiastical building. We in England usually employ our synonym "aumbry" in the latter sense only, though no logical reason exists why it should not be equally applied to domestic cupboards. In the early abbeys, when monks used the words work and worship side by side, it was necessary to have some place close to hand wherein, when the time for field labour came, they could easily deposit those books they had in daily reading; consequently, we generally find in one of the cloister walls an *armarium* or *armariolus*, as these niches were then called, in which to inclose them. These were carefully guarded by doors, for books were trebly precious then, and were valued highly—so highly that their receptacle was often equal in architectural rank to those which were destined to contain the sacred vessels of the altar, or the most precious relics of the sacristy. Before the introduction of the "tabernacle," in which the Holy Sacrament is retained on the altar itself, aumbries were used for this purpose, being frequently found on the north side of our chancels; and the learned Thiers, in his "Traité de l'exposition du Saint Sacrament," published in the latter half of the last century, distinctly refers to the usage of these aumbries for this purpose, as well as to the ancient custom of depositing there the holy oil, which was used in the rite of extreme unction. The Archbishop of Corenze, in Calabria, who also wrote at the latter end of last century, notes the "recent disuetude into which these ancient receptacles have fallen." At present in the Roman church they have been completely abandoned; the temptation of mounting a "Chubb" or "Milner" on the altar, and veneering it with marble, has been too great to be resisted. This, and the popularity of the modern rite of "benediction," has deprived the aumbry of its dignity. Destruction followed on disuetude, and where it yet exists it is found chiefly tenanted by spiders and dusters. How important these receptacles were considered is shown by the record of one which was provided for the Sainte Chapelle at Paris, described by Morand, who published his history of this

* Dictionnaire Raisonné de l'Architecture Française du XI. au XVI. Siècle, par M. VIOLETT LE DUC, Architecte du Gouvernement, Inspecteur-Général des Edifices Diocésains. 10 vols.; 8vo.; Morel, Paris, 1854—1868.

building in that very eventful year 1790, as being constructed of gilt bronze, and ornamented with several figures; its doors were fastened by ten keys, six of which undid the outer doors, and the remaining four opened internal trellis-work, which allowed the precious contents to be seen, but not stolen. We need, however, no better illustration of the importance of these objects of Church furniture than that which we engrave (Fig. 34) from the abbatical church of Souvigny, and which dates from the commencement of the fifteenth century. This is very rich in its detail, and is placed in the south transept of the church. The doors are of wood, yet retaining much of their painted decoration, and this interesting relic of the past has most singularly (perhaps, we ought, considering the relics it once contained, to say miraculously) escaped the ravages of the Revolution.

The next definition we encounter is that of the word *armoirie*, or heraldry, a science too much despised by our modern architects. It is true that heraldry has been stigmatised as "the science of fools with long memories;" but architects, whether with long or short memories, justly deserve the epithet, if they do not know somewhat of it, especially such as are not sufficiently wise to abstain from "blazoning" their ignorance. We know an instance of a pretentious porchway, where an ignorant architect has scattered broadcast innumerable shields, and whereon he has set forth that his client is both a bastard and a traitor. Happily, the owner is as ignorant as his architect, but should his eyes ever be opened, we do not think he will thank that man who thus has held him up to scorn and shame. We would, however, recommend its study on broader grounds than mere bread-winning. As an expounder of historical or archæological puzzles, heraldry is an invaluable aid, and our heart has often ached when a learned architect has come down to restore some village church, and has improved these sculptured records from off its walls; or, what is worse, has renovated them according to his folly. It is not a hard science; indeed, its first rules and principles are easy to acquire. They have been reduced to their smallest bulk in the crucible of ages, and the very fact that the school of colouring has for its axiom, "That colour must not be placed on colour, nor metal upon metal," shows a long period of observance of the changes effected by juxtaposition. The broad, well-marked, simple lines of the principal ordinaries also show a great knowledge of what forms are most readily impressed upon the eye and the mind. Both these things demonstrate that a long period of observation must have preceded this settled order. Nothing is perfect at first, and the wise reflection of long ages was embodied before heraldry had achieved its perfection in the thirteenth century. We cannot here enter into a treatise on the science, as M. le Duc has done; such treatises or handbooks are easily to be procured by the student at a small cost. We shall, therefore, confine ourselves to extracting from the essay now before us such comments as are not likely to be found so well expressed elsewhere.

After remarking upon the general "charges," as the ornamentation of the shield is called, and passing from things inanimate to those culled from the animal world, our author remarks that "During the thirteenth, fourteenth, and fifteenth centuries heraldic animals assumed those conventional forms which it is necessary to know well, because they were not adopted without reason. Meant to be seen at a distance, it was requisite to give a very distinct outline to them, and the heraldic artist of those days argued that it was a *sine quâ non* that his picture should be recognisable. Consequently the members of the animal represented must be well detached from the field, its movements exaggerated, and its physiognomy perfectly distinct, or at a certain distance there would be but a confused blot of colour on his 'scutcheon.'

During the sixteenth century decorative art became softer and weaker, and heraldic figures lost that character which made them so readily recognisable. The artist then wished to give a greater reality to his work, and inasmuch as heraldry is purely a conventional art, this attempt at realism was in direct contravention of its principles, and, divided against itself, it fell. Hence it is necessary to imbue oneself with a knowledge of the forms given to animals before we would draw or restore old heraldry. Of these forms M. le Duc gives many examples, and their drawing is so clear, sharp, and distinct that we cannot refrain from reproducing some of them. We have here the lion (Fig. 35) rampant, as in the arms of Scotland; the leopard (Fig. 36), as the French will still persist in calling our English beast, who "passes guardant 'cross th' ensanguined field;" the wolf (Fig. 37); the stag (Fig. 38); the wild boar (Fig. 39); and the dragon (Fig. 40), all admirable specimens of purely heraldic drawing of animal form; whilst the arms of Paris (Fig. 41) show how admirably M. le Duc delineates, on the same principle, inanimate forms. We would particularly draw the attention of decorative painters and stone carvers to these figures. Half the labour bestowed on the lumpy, muddy caricatures they are in the habit of disgusting us with, would, if properly directed, produce a much more pleasing and spirited result, and both pleasure and profit would result from the study and the practice of the principles here inculcated. Not only does the shield and its charges receive consideration at the hands of M. le Duc, but all the accessories pertaining to the "gentle science" itself are passed in review by him. Speaking of supporters (those figures which sustain the shield, as the lion and unicorn do the regal arms of England), he says, "The origin of this usage may be found in the tournament. The knights there caused their helmet, lance, and shield to be carried by pages or valets, attired in strange costume, or disguised as animals. At the commencement of a passage of arms these 'supporters' (*tenants*), guarded the arms of the combatant at the place assigned for their exhibition, and where he who would engage their owner came to touch his would-be adversary's shield. These 'supporters' were dressed as dwarfs, as giants, Saracens, and savage beasts, and the heralds waited hard by to record the names of those who thus sought the combat. At the celebrated tournament which took place at Chambery, on the 1st of May, 1346, Amadeus VI. of Savoy caused his shield to be guarded by two huge lions, and which, ever since that day, have done duty as the supporters of the family arms. The choice of these animals was probably induced from the fact that Chablais and the Duchy of Aosta bore each a lion on their shield. The armorial insignia of the twenty knights who there fought in mimic battle remained for three centuries in the Franciscan church, and it was not until 1660, when the good fathers 'beautified and white-washed' their church that this precious relic of Mediæval pageantry was destroyed. Charles VI. was the first French monarch who used 'supporters' for his shield. He one day, at Senlis, captured a stag, which bore round his neck a golden collar, engraved with the words, *Cæsar hoc mihi donavit*, and from this strange circumstance the two stags which supported the arms of the French kings until the time of Louis XII. found their way into regal heraldry. Louis XII. adopted a couple of porcupines, and Francis I. chose two salamanders for his 'supporters,' and the fashion spreading, almost all the noble families of France in the sixteenth century, added the new accessory to their arms, changing them at will." M. le Duc commits an error in speaking of our English usage on this point. He says, "the English kings had for supporters of their arms a *leopard* [he won't let us have a lion] and a unicorn. But these supports are posterior to the reunion of Scotland to the

kingdom of England. Before this epoch the supporters of the arms of England were a lion and a dragon, this last symbol being derived from the order of the Garter." The italics are our own, and we are surprised that so learned an antiquary as M. le Duc should fall into such an error. The fact is, that our kings were very variable in their choice of supporters, but the dragon was adopted by Henry VII., who claimed descent from Cadwallader, the last king of Briton, and who thus set off his claim by affixing the insignia of ancient Cambria to the arms of England. As these supporters figure very frequently in the gargoyles and other "vestiaries," of our old churches and domestic buildings, it may be as well to give a short notice of those borne by our English sovereigns. They were first adopted by Richard II., so that their introduction in the two countries was contemporary. He adopted two angels as his adjunctive emblems, the which were retained during the early part of the reign of his successor, Henry IV., who, however, soon changed them for the lion and antelope. Henry V., aiming at France, captured their two stags, and chained them to the English arms, using, however, sometimes one stag only, with a lion guardant on the dexter or right-hand side. These two antelopes did duty for his successor Henry VI., but in Edward IV.'s time they were changed for the black bull of Clare and the white lion of Mortimer; Edward V. used the lion and the white hart; and "the crooked-backed tyrant," Richard III., used sometimes two boars, and at others a bull and a boar for his supporters. Henry VII., as we have before stated, took the rouge dragon of Cadwallader, and the white greyhound of the house of Somerset. Henry VIII. used at first the same supporters, but afterwards adopted the crowned lion and retained the red dragon of the Tudor. Edward VI. chose a lion and a griffin; Mary, the greyhound and the crowned eagle of Spain, sometimes uniting the two countries under the symbol of our British lion and "that cruel, evil-omened bird of prey." Elizabeth went back to the ways of her father and chose the same supporters; whilst James I., in order to mark well the country from whence he came, added to the lion of England the appropriate symbol of a savage man. The "white king," Charles I., used the lion and an angel vested in a surcoat of fleurs-de-lys, in fanciful compliment to his French wife. But the days of heraldry were over, and after the Restoration the supporters now in use were adopted. The catalogue of beasts and birds, and creatures which are neither, we have just given will explain many a village sign, many a quaint device, and open out a fruitful fund of musing for such as delight to find out the why and the wherefore of the daily history they come in contact with. This is, however, only one of the byeways of history that heraldry keeps the gate of, and he who studies it will find himself more than amply repaid for the trouble of mastering its preliminary "jargon." The lambrequins or mantlings, the badges and cognisances, the mottoes, devices, and rebuses of our English heraldry played a great part in domestic and ecclesiastical decoration, and he who cannot unravel these loses an immense pleasure; he sees but the outside binding of that volume of personal history the buildings of his country would bid him peruse; but he is unlearned, and the clerkly lore they bid him read is lost to him, and probably condemned by him as foolishness, because he himself is not wise enough to understand it. City and borough arms are full of history, and many an episode for the decoration of our public buildings might be drawn from the chronicle they cover, but a dull, bad copy from an ill-cut modern seal is all the untaught architect can use. Even this he generally gets carved with the most zoological exactitude, and the most utter absence of the recognition of these fixed principles which should guide him.

Heraldry fell when it came to be used simply for the purpose of personal vanity; and when arms were gained, not by straightness of back in the camp, but by dorsal suppleness in the court, they ceased to be a mark of true nobility, and in France a death-blow was dealt to the science by the decree of Louis XV., which established the "Noblesse Militaire." Enrolled in this, no particular right to bear arms was needed; good ancestry was of no value; the fact of belonging to this order was sufficient, and once in it armorial bearings followed as officially as if the newly-elected was an M.P. of our day. Individuality was gone, officialism reigned in its stead; consequently, so personal a science died. But we must terminate this disquisition with the eloquent words of our author, regretting that our space will not allow us to make more use of those three-and-thirty valuable pages he has devoted to this interesting subject. "The institution of military orders in the twelfth century had created confraternities powerful enough to alarm the kings of Christendom. It was feudalism, not disseminated and in rivalry, but organised, armed, and powerful enough to dictate very hard conditions on its sovereign. The monarchical power, after having broken this bond, desired to refold it round itself, making it a rampart of protection rather than a column of attack. It instituted, therefore, during the fifteenth and sixteenth centuries the orders of S. Michael and the Holy Spirit; during the seventeenth century the order of S. Louis; and, later still, Louis XV. founded the Order of Military Merit. These institutions did away with the last love of armorial bearings. Thenceforth the nobility regarded them simply as a generic sign; they were no more an individuality. Monarchy put itself in the same rank, and covered with the same mantle the old and the new nobility alike, and the night of the 4th of August, 1789, saw those shields which this mantle veiled broken by the mob, who only regarded them as a symbol of unjust privileges, and no longer the mark of important services rendered to the country. The royal shield of Louis XVI. [erroneously printed XIV.] had covered the whole of the nobility of France; in the day of danger it found itself alone—it was broken."

The last word of this first volume of M. le Duc's invaluable work is *aronde* (our dovetail), as applied to masonry and carpentry—a word needing but little explanation at our hands. Its use is treated of in both these arts, and its abuse referred to in those examples of pendant vaulting such as we have in King's College, Cambridge, and Henry VII.'s Chapel, Westminster; but we shall have to revert to this subject in that distant day when the word "vaulting" is reached. Long as our review of it has been, we close this first volume with a feeling of regret that it must remain a sealed book to many, and with a wish that we could have given our readers more of it; but eight others await us, and we must not dwell too long on one.

One rather important class of edifice it is desirable to notice—a class which at one time bade fair to introduce an important change in religious architecture, but it became official. It was adopted by a party, and when that party fell it ceased—we mean the circular churches adopted by the Templars. These, borrowed from the East, strove to impart another oriental feature, but from the cause above indicated their influence was restricted. In the Early Christian architecture of the East, circular edifices were common, and this form appeared to be about to develop itself in the West. Without speaking of the numerous circular edifices erected at Rome under the reign of Constantine, and which were as much Roman as Oriental in their idea, we find from the fifth to the twelfth centuries a great number of edifices adopting this form erected. At Paris, Childebert built, where now stands the Church of S. Germain

l'Auxerrois, a church which bore the name of the Round Church of S. Vincent. On the left of the entrance of the Cathedral of Paris stood the round chapel of S. John. At Dijon there yet remains the lower storey of the round church of S. Bénigne, commenced in the seventh century—a reflex of the church of the Holy Sepulchre at Jerusalem. Charlemagne's round church at Aix-la-Chapelle was imitated in the twelfth century at Ottmarshheim. In the eleventh century the foundations of a round church were laid at Neuvy Sainte Sepulchre, near Chateau Roux; and in the twelfth century an enormous circular church with triple aisles was constructed at Charroux. In England many attempts at its introduction were made. Indeed, the influence of this form even lingered down to the time of Catherine de Medicis, who built at S. Denis a mortuary chapel after the fashion of the Holy Sepulchre, as a cenotaph to her husband. Other attempts at the re-introduction of Eastern elements were made from time to time, but its influence had ceased to be vital.

NOTES ON CARPENTRY AND ON STRAINS IN STRUCTURES—VII.

IN the last article we referred to the European red pine (*Pinus sylvestris*), better known as Baltic fir, although the Scotch fir is of the same kind; and also to the European white fir, or Norway spruce (*Pinus abies*). We shall now speak of American pine. There are two sorts, called here red and yellow. They come from Canada and North America, and are there differently designated as to colour. Mr. Cressy says of yellow pine: "The white or Weymouth pine (*Pinus strobus*) is brought into the English market from Canada or North America. Its annular rings are not very distinct, nor is its durability remarkable, being subject to dry rot. A cubic foot weighs 29lb."

On the subject of American timber we have preferred to consult as an auxiliary authority an American author, and have looked into the "Elementary Course of Civil Engineering," by D. H. Mahan, M.A., sixth edition, 1860, in which he says of the white pine or northern (American) pine (*Pinus strobus*): "This tree takes its name from the colour of its wood, which is white, soft, light, straight-grained, and durable. It is inferior in strength to that of other sorts, and it has the defect of swelling in damp weather. Its timber is, however, in great demand as a good building material, being almost the only kind in use in the Eastern and Northern states for the framework and joinery of houses, &c."

Mr. Newlands says of this wood: "The Weymouth pine or yellow pine, called in America the white pine, is imported in large logs. Its wood is light and soft, straight-grained, and free from knots, which fits it for joiners' work, especially for mouldings. Its colour is a brownish yellow, and the colour and texture are very uniform. It has a peculiar odour. The most important information to the carpenter, however, is that in the construction of the magnificent wooden bridges over the Schuylkill, at Philadelphia, and the Delaware at Trenton, and also in the bridges which unite Cambridge and Charlestown with Boston, of which the first is 1,500 feet and the second 3,000 feet in length, the white pine has been chosen for its durability. . . . But, however highly this pine may rank in America as a timber for the carpenter, it is not esteemed in this country. It is inferior to the Baltic timber in strength and hardness, and is not to be compared to it in durability. It is liable to the dry rot, and is therefore, and for the other reasons given, never employed in the carpentry of the best houses, but is exclusively used by the joiner."

Of another variety, the yellow pine of America, that is to say the pine which is called yellow there, the *Pinus Mitis*, Mahan

says: "The heart wood of this tree is fine-grained, moderately resinous, strong and durable; but the sap-wood is very inferior, decaying rapidly on exposure to the weather. It is found in greatest abundance in the middle states. In the Southern states it is known as spruce pine, and short-leaved pine. Long-leaved pine, or Southern pine (*Pinus Australis*), has but little sap-wood, and the resinous matter is uniformly distributed through the heart-wood, which presents a fine compact grain, having more hardness, strength, and durability than any other species of the pine." And Mr. Cressy says of the *Pinus Mitis*, or yellow pine, that it is called in England the New York pine, and is very full of turpentine, and is more durable and of greater strength than the white pine. It does not attain so large a size, but is a more valuable timber.

Of oak, Mr. Newlands says there are many species, the most common of which in this country are the *Quercus rober*, or *Quercus pedunculata* (the common oak), and the *Q. sessiliflora*, or the sessile-fruited oak. The former has its fruit on a long foot stalk or peduncle; the latter has its fruit sessile, or on a very short stalk. The common oak is of slower growth than the other, which, moreover, tends to grow with a more erect stem and less tortuous branches. The common oak is believed to be more durable than the sessile-fruited oak. The oak grows best on a clayey soil, and it is in the alluvial deposits of England and Scotland where the noblest specimens of this tree are to be found. The wood of the common oak, the *pedunculata*, is stiffer and yet more easily split than that of the *sessiliflora*. Its colour is lighter, and its specific gravity not so great. The wood of the *pedunculata* contains more of the silver grain than the other. It splits clean. Its stiffness recommends it for beams, and its quality of resisting alternations of wetness and dryness renders it valuable for piling. The weight of a cubic foot of each kind is as follows:—

	Q. PEDUNCULATA.	Q. SESSILIFLORA.
When Green	76·13lb.	80·50lb.
When Half Dry	65·90lb.	67·12lb.
When Perfectly Dry	52·13lb.	51·10lb.

Professor Rankine says: "The old English oak, or stalk-fruited oak, in which the acorns grow on stalks, and the leaves close to the twig, and the bay oak, or cluster-fruited oak (*Q. sessiliflora*), in which the acorns grow in close clusters, and the leaves have stalks: these are the two kinds that grow in Europe. The wood of the stalk-fruited oak is lighter in colour and has more numerous and distinct medullary rays [the scientific name of the 'silver grain'] than that of the cluster-fruited oak, in which they are so few and indistinct as to have caused it in some old buildings to be mistaken for chestnut. The stalk-fruited oak is the stiffer and straighter-grained of the two, the easier to work, and the less liable to warp; it is therefore preferable where stiffness and accuracy of form are desired; the cluster-fruited oak is the more flexible, which gives it an advantage where shocks have to be borne. The wood of the oak contains gallic acid, which probably contributes to its durability, but tends to corrode iron fastenings.

Mr. Gwilt says that the specific gravity of the first-named wood is .8, and its weight 50·45lb. per cubic foot; and of the latter kind the specific gravity is .875, and its weight 55lb.; their cohesive forces are proportionable. The red oak of Canada, the *Quercus rubra*, is a light, spongy, and far from durable wood. Its growth is rapid.

Mr. Cressy says that the *Quercus alba*, or white oak of America, and the *Q. rubra*, or red oak of Canada, are of quick growth, and not so durable as the British oak. Wainscot is obtained from the Riga oak, which is very clean and free from knots, and much in request by the joiner, forming good flooring and wainscoting.

Oak varies in its specific gravity according to the soil which produces it; its strength is in proportion to its density, and that timber is the most durable which has this quality in the highest degree. Density is mainly owing to the length of time occupied in the production of the timber; that which grows fast, as it will do in light soils, is not so heavy, or so hard and compact, as that produced on cold soils and by slower growth. From all experiments made upon the strength of oak timber, it has been found that this is in proportion to its weight and density, and invariably the heaviest is the strongest. In the trunk of a tree the most dense wood is found in the lower parts; this quality decreases in those branches which are farther removed from the base. Trees which are suffered to complete their full growth have their heart-wood throughout of the same weight and strength, whilst those cut down prematurely are found to possess these requisites only in their centre wood.

Timber may be too much dried. It may be reduced to two-thirds of its original weight, but is weakened by the process. It is best for carpentry when about one-sixth of its original weight has been dried out. Oak seasoned so as to reduce its weight to 60lb. per cubic foot is the most preferable.

Some of the oak timber procured for the pointing gates we mentioned in a former article had dead knots, which were grown partly or completely over on the outside, and one of the carpenters said of these that the cause of the bad knots was that boughs had been cut off close to the bole or trunk of the tree many years before it was felled, and that the sap-wood had grown over it; whenever, therefore, boughs are cut off while the tree is standing they should be cut at such a distance from the bole that the growth of the tree will never quite enclose the knot. Trees that grow on old stumps have rotten holes in the butt ends, for the new wood grows round the old stump, which soon decays and leaves a bad hole in the new one. Hedge-grown trees are most likely to have bad knots, on account of the boughs being so frequently lopped off. Those trees with the longest boles are the most valuable per foot, having fewer knots. Those knots with a tongue in the middle are less likely to turn out bad inside than those without tongues.

Another carpenter had it that Memel timber comes the longest and most parallel of any fir, and runs from 11in. to 14in. square.

American red and yellow pine come in good lengths, but taper more than Baltic fir. Of the two pines the yellow comes the larger. At one time the Americans would not load a ship entirely with deals, but compelled her to bring a certain quantity of log timber with a cargo of deals.

The timber both from America and the Baltic always comes axe-hewn, nearly square, and is generally thicker through the middle than at the edges.

When fir first arrives the sap is hardly distinguishable from the heart, but after lying in a timber pond for some time, or on the ground, the sap turns blue, and is seen immediately on the piece being opened.

Teak and African oak are very much alike, the Indian teak being the better of the two. A good deal of teak is used in ships, but he has seen a piece of it taken out of a ship quite rotten, which had been in only four years.

English elm will last as long, when kept entirely under water, as any timber known; ships' keels are often made of elm; but if it is exposed to both water and wind it rots very soon. He thinks American red pine will last as long entirely under water as Memel or other Baltic fir.

Timber exposed to the weather before it has been properly seasoned becomes rifted or shaken, but it is also shaken sometimes in the upper end when it is felled, by falling against other trees or across logs on the ground. The common defects of timber are sap, shakes, and dead knots.

In a course of lectures delivered at the Royal Engineer establishment, Chatham, in 1867, by Thos. Laslett, Esq., Inspector of Timber at Woolwich Dockyard, it was said that of Baltic timber the Dantzic fir is the best for strength, when the sap wood is removed, but the sap wood is excessive in this kind, and is not distinguishable at first from the heart wood. Logs come from 18ft. to 45ft. in length, and from 11in. to 18in. square. Deals cut from this timber are sorted for the trade into crown and crown brack qualities, brack being of about two-thirds value of crown. The specific gravity is 582. The relative values of the various sorts selected for commerce were at that time 80s. per load of 50 cubic feet for crown, 65s. for best middling, 52s. for good middling, and 40s. for common middling. Although prices form no part of our present subject, these prices may show in general terms the relative worth of the various sorts of Dantzic fir.

Riga fir, it is said, is straight, free from large knots, and has but little sap wood. It is not much converted into deals. Logs come from 20ft. to 50ft. long, and from 11in. to 14in. square. Its specific gravity is 541.

Canadian red pine takes its name from the reddish colour of its bark. Its timber is white, clean and fine in grain, and smooth and silky in appearance when worked. It has very little sap wood. It neither warps nor splits in seasoning, and has few large knots.

Canadian yellow pine, or, as it is called in America, white pine, is the produce of a lofty, straight-growing tree, found abundantly between Nova Scotia and the Rocky Mountains. Its specific gravity is 452. It comes in logs of from 18ft. to 24ft. in length, and from 14in. to 24in. square.

Pitch pine, from Virginia, comes in logs of from 20ft. to 40ft. in length, and from 11in. to 16in. square. The tapping of this tree for turpentine tends greatly to lessen both its strength and durability.

Kauri or Cowdie pine, from New Zealand, is a fine wood. The trees commonly grow from 60ft. to 70ft. clear of branches, and are from 3ft. to 5ft. in diameter at the base. Its mean specific gravity is 530.

THE SWIMMING-BATH AS AN ART INFLUENCE.

SO much has lately been said, and happily, on the subject of swimming-baths for the people that it would seem to be almost impossible to add anything useful to it; but there are, nevertheless, not a few practical details which remain to be noticed, and without attention to which the whole scheme, if ever acted upon, must come almost to nought. Be it our province here to add a few notes on the practical requirements of swimming-baths, and a note or two on their artistic influence, if in any way properly and thoughtfully carried out. And first, it cannot but have struck most people who are, or who pretend to be, interested in this question of bathing and swimming, that while old Pagan and barbarous Rome numbered such costly and magnificent baths fit and suitable for all, so that no one who wanted a wash ever needed to be without one, modern and highly-civilised London cannot be said to possess baths enough for one hundredth part of its teeming population of some three millions and a quarter of human beings. And not only were the old Roman baths plentiful enough, but they were architecturally and artistically magnificent, and artistically instructive—not insignificant eyesores, as ours are, but things of beauty to go and see and to be delighted with. What a contrast between the ways of Pagan barbarism and high civilisation!

It has happened somewhat unfortunately that, in consequence of the small number of baths London has asked for, almost every

one of them has been built and contrived by some one to whom the subject was a new one. No one ever seems to have considered, in the planning of a swimming-bath, that something more is required than a large tank of shallow water, a little deeper at one end than the other, and that bathers need but tumble in somehow or other, and after a while—as short a time as you will—crawl up a few awkward steps and out again. But any one practically acquainted with swimming matters will know that this poor work is nothing, and tends but to keep people away from baths altogether, and that it is only the most hardy and enthusiastic that can or will go through the inconveniences, and horrors almost, of the present miserable arrangements. It must be evident to most that those who are most attracted to a swimming-bath, and most likely to use it persistently, are boys and youths, and that such are not to be satisfied with the mere shallow water, and the keeping in it for half an hour, even if trying to learn to swim in it, and still less so if they be practised and clever swimmers. A swimming-bath should, to meet the wants and requirements of such people, partake of the character of the gymnasium, and admit of bodily exercise out of the water as well as in it, like the old Roman thermæ, and, indeed should be properly planned and constructed, with some, at least, of the usual apparatus of such a place. It is, indeed, surprising to read history a little apart from wars and tumults, and kings and queens, and to see in it how people in old times lived and acted. Let anyone try to fancy for a moment, if he can, what would be thought of the “reading” of Homer or Shakspeare to a company of bathers, fresh from the water of a swimming-bath, and to know that such bathers had been there for the express purpose of bringing themselves into better humour for the hearing of fine and noble passages of poetic fervour. And yet this was one of the express purposes of the Greek and Roman thermæ. A man with a new poem or even a new history went to the swimming-bath to read a part of it, quite sure of an audience in a fit state of mental and bodily health to listen to him and appreciate his performance. Are we in reality progressing educationally? Were the old Greek and Roman ways of life foolishness and error, or was there in them much that was true and well worthy of imitation? In a great Roman bath there were always not only bathers and swimmers and gymnasts, but an audience and spectators, and there can be but little doubt that a good deal of the great art of the sculptor is to be attributed to the opportunity afforded to the sculptor of those unenlightened days for the study of the form and movements of the human figure. No wonder that the Greek produced the work he did; everything in his daily life went to help him in his work; the thermæ were a part, and an important part, of this help. There can be no sort of doubt that a large bath in London, modelled after the Greek or Roman, would prove a success; for human nature is pretty much the same as ever. The old Greek or Roman of centuries back would have no need to hide himself from modern eyes, however critical, for though he lacked much, doubtless, that we have, yet had he much, and very much, that we have not. Fine art being one of the necessities of his existence, and there being no “precedent” or “antique” to go by, he was compelled to appeal to Nature whenever he could find it. Again, in the construction of a swimming-bath on a new and hitherto untried plan, and keeping well in view that something more than the mere water is needful, provision should be made for an ample shore to the bath, i.e., a way right round it, so that the water can be approached from every side. The inconveniences of the opposite plan will be evident by inspecting any common bath, as at Endell-street, or Smith-street, Westminster, where this has been omitted. A wooden

floor, too, it may be mentioned, is better than stone, for who is there in these poor days that dares to think of a warmed marble floor to a swimming-bath? Next as to the depth of the water—a most important point. At one end, of course, it may be shallow enough to allow of very small people paddling about without danger of drowning, and for learners who are timid of water; but the plunge end of the bath should be deep enough for a “perpendicular,” say ten feet. Suppose it a small bath, 50 or 60 feet long, and 20 or 30 wide, then might the depth at the deep end be, as we have said, 10 feet, gradually shallowing to five feet to within a few feet of the shallow end, leaving only a few feet of very shallow water for learners. Thus we have deep water and a good shore all round it. The water should be 15 or 18 inches below the level of the shore floor of the bath-room, so as to allow of a “running plunge.” Of course, at the deep end of the bath there must be a plunge platform. This apparatus, simple as it is, is always so contrived as rather to render its legitimate use impossible than otherwise; but without a drawing we could hardly, in mere description, make our meaning intelligible, or the proper kind of apparatus plain to the reader. It is all-important in a swimming-bath, and is indeed the “art” apparatus element in it.

We would gladly say a few words on the architecture of a swimming-bath; but as things are it would seem to be almost hopeless to look for any architecture at all in such a place. The architecture common to a bath of the day will be generally found to consist of plain brick plastered walls (sometimes not even that) and a corrugated iron roof with a skylight, the worst of all possible forms for a bath-room, inasmuch as it cannot keep cold out nor the heat in. The old Romans were surely in advance of us here, for if, as has been contended, the present Pantheon, now a chapel, was, in the says of its prime, part of a bath, some faint idea of the size and magnificence of the Roman *thermæ* may be got by those who must needs be content to dream of these things. They certainly never can see them. There is, however, near the General Post Office a small bath worth visit, some century or more old, very quaintly designed, with fragments of marble pavement—a mere fragment of the past, for there were baths in in England at one time. This architecture and sculpture, as parts of the idea of a bath, seem to us to be all important, for a mere washing apparatus can be got at by any one as it is; but our notion is that a swimming-bath can be, and ought to be, after “the antique,” made a work of fine art, and a means, as we have so slightly indicated, of educating artists; for why should not the swimming-bath be made a drawing school for the “figure?” How much better, surely, it would be to study and copy the movements and forms of the human frame in natural, and healthy, and graceful action than to spend time and thought, as they do at the Royal Academy, over the awkward and unnatural “set figure!” May it not be a question here whether we are at the beginning of a true art action and system of art education?

One more passing thought in part illustrative of what we are here contending for. It is a very curious, but hitherto almost unnoticed question, as to what kind and amount of change—educational change—takes place in human character by the immediate presence of objects of really noble fine art, whether of architecture or sculpture. Did, for example, the presence of noble statuary do any good to a Greek, it could do him no harm; but did it influence his mind and mode of thought in any way; in short, was he any the better for it or no? We cannot help thinking that he was, and that the perpetual presence of noble “figures” in a room must add to the comforts and delights otherwise to be found in it; and it is with this thought, which many will doubtless agree with, that we think a

good bath should have in it, and as a part of it, some few, at least, of the great antique figure sculptures—such, for instance, as the Discobolus, the Gladiator, the Ajax, and others—a few better than none. We must contend for the genuine, and unrestored and unpainted antique, for the simple reason that it is the genuine interpretation of Nature by the hands of the old sculptors. We see in it what they saw of Nature's best work; while all modern work of the kind is at best but second-hand work, and seen by a reflected light, and produced under the impression that there is in the antique, from which it is always inspired, a something superior and above Nature, not to be rivalled, or indeed even copied; while the fact really is that were the same means and method of work open to the modern man as they were to the old Greek and Roman, the same results would, doubtless, in time follow. Might not, therefore, swimming baths and gymnasia, on an artistic idea, help on this great work of the future? C. B. A.

FIRE-BRICKS.—II.

By CHARLES TURNER, C.E.

MOULDING.

THE first fire-bricks made were all hand-moulded, sand stock fashion, in the usual manner practised in the district. The lumps were cut off with a wire and the face of the brick struck with a wooden strike kept constantly wet. The moulds had to be of very large size, owing to the great contraction of the brick in burning. They were 10½ in. long, 5½ in. wide, and 3¼ in. deep. The moulders were sometimes assisted by a boy, but generally worked alone. They wheeled the bricks to hack, set them in hack, and looked after them in hack. The price paid to them was from 6s. to 6s. 6d. per 1,000. The Dorsetshire brickmakers are never very quick hands, and the lumps of clay were much larger and heavier than they were accustomed to handle; the best men could not make more than 700 per day.

CROWDING.

The bricks were wheeled to kiln in the usual crowding barrows. This was generally done day-work, as it was found the men took more care of the bricks; but the wheeling, setting, drawing, and stacking were sometimes let piece-work at 2s. per 1,000.

DESCRIPTION OF KILNS.

The kilns used were open-topped kilns, sometimes called Essex kilns, horsed at bottom, with three or four fire holes, and fired from both ends. The large kilns held 46,000, the smaller, 32,000. The horses were 11 in. wide, the spaces 3 in. The bricks were set in 12 in. bolts upon the horses for a depth of about 3 ft., and then crossed with wider bolts. We could only burn the fire-bricks in the bottom of the kilns, as the heat of the upper part was not sufficient to burn fire-bricks—indeed, none of the fire-bricks, except those close down upon the horses, could ever be burned to a proper pitch in these kilns, and the result was bricks of three sizes, which had to be sorted into best, seconds, and thirds.

DRYING AND BURNING.

The time occupied in drying varied, according to the weather and the state of the goods (although the kilns were protected by a corrugated iron roof), to from 72 to 96 hours; full fire, 36 to 48 hours; cooling down, 96 to 120 hours. The burner was paid 1s. 6d. per 1000. The coal was delivered into the kiln pits. The coal mostly used was Welsh coal to begin with, and Wylam's North Country coal to burn off with.

AMOUNT OF FUEL USED.

This differed considerably, according to the weather and the quality of coal used. It was considered a favourable result if a kiln containing 12,000 fire-bricks and about

25,000 common bricks did not consume more in drying and burning than eighteen tons of coal, or about half a ton to 1000 bricks. The mode of ascertaining the progress of the kiln was by the settlement on the top. When a kiln of this size had settled down 9 in. it was considered to be fully burned. The price of the Welsh coal at the works was 16s. per ton, Wylam 20s. 6d.

PROBABLE HEAT REQUIRED TO BURN FIRE-BRICKS.

There was no means of ascertaining this except relatively. The Beacon Hill fire-bricks required about one-third more to burn them to a proper pitch than ordinary red bricks. The probable heat when burned to a proper pitch was that at which wrought iron would run. This was ascertained accidentally. One of the brickmakers, when counting his hack, left a nail as a mark in one of the bricks. The brick with the nail in it was set in the kiln. When drawn the nail was found to have run into a shapeless mass, while the brick was just burned to its proper pitch. It was, as before observed, very difficult to burn the bricks to a regular size, owing to the varying heat of the kiln. The bricks which were underburned were too large, and too fragile to bear transport.

DRAWING AND STACKING.

This was executed in the usual way, the bricks being divided into classes according to their size and quality. The underburned fire-bricks turned green from the action of the weather.

WASTE.

From the cause above mentioned the waste on each kiln was considerable, never averaging less than 10 per cent. per kiln, and frequently rising to 20 per cent.

SIZE AND WEIGHT PER THOUSAND WHEN BURNED.

Hard burned bricks, 8½ in. long, 4½ in. wide, 2½ in. thick; underburned do. 9½ in. long, 4½ in. wide, 2½ in. thick. Weight per 1000, about 3¼ tons.

PRICE IN PLACE.

The price asked for the best bricks was 45s. per 1000. All those that were made were sold.

CARTAGE TO STATION AND RAILWAY RATE.

The cost of cartage to Poole Junction, including turnpike, was 4s. per 1000. The railway rate to London was 6s. 8d. per ton, or 20s. per 1000.

COST OF MAKING AND BURNING.

Summing up the foregoing figures, this amounted to 29s. 9d. per 1,000; or, including extra expenses for contingencies and management, left a profit of about 12s. 6d. per 1,000.

EXPERIMENTS WITH THE ABOVE BRICKS.

These fire-bricks are found to stand remarkably well in the horses and fire-holes of the kilns at the works, also in lime-kilns; but they did not stand well in the salt-glazed kilns, either at the South-Western or at the Lambeth Potteries, being found to soften when exposed to the heat and flux, and to elongate as much as 2 in. under pressure when so heated. They were also too weak to bear long transport when loosely packed and grinding against each other; 5,000 sent to the West Indies ground themselves almost to pieces on the voyage.

FIRE-CLAY CEMENT.

A material composed of the same proportions of fire-clay and grit, but sifted through a fine sieve, was tried for a lining to a small eupola furnace at the Dorset Iron Works, instead of the usual lining of road grit. It was found to answer very well for the first melting. It began to run at the second melting, and ran so as to choke the furnace at the third melting.

ROUGH STUFF.

In consequence of the result of these experiments, it was determined to try a proportion of rough stuff or crushed burnt fire-

clay as a substitute for a portion of the grit. The clay was burnt at the top of a kiln of bricks, and crushed under the clay runners through the $\frac{1}{2}$ in. grating. The result of this alteration was very satisfactory, as the fire-clay cement lining to the cupola stood three burnings extremely well, and bungs built from these bricks in the salt-glazed kilns of the Lytchett and South-Western Potteries stood without the least appearance of softening or elongation. There was, however, still a tendency to run when these bricks were used for the crowns of salt-glazed kilns. It was therefore determined to reject the grit altogether, and use rough stuff in its place. The rough stuff was burned and crushed as before, but half of the gratings were used of the $\frac{1}{2}$ in. gauge, half of the $\frac{1}{4}$ in. The clay and rough stuff were mixed and wetted up as when the grit was used, and the bricks were hand-moulded, fine rough stuff being used instead of land for landing the moulds.

EXPERIMENTS.

The result of the experiments with this new mixture of clay and rough stuff were much more satisfactory. It showed very little tendency to run, except in a slight degree round the blast-hole of the cupola furnace; but it still cracked, and opened, and separated into masses.

CALCINED CLAY.

It was then determined to try the effect of calcining or half burning the fire-clay before it was used. Experiments were tried with various mixtures of these materials, sometimes with the addition of a small quantity of pounded and finely-sifted graphite. By carefully comparing experiments it was, however, found that no result in proportion to the additional expense was arrived at from the use of the graphite. The most useful proportion for fire-clay cement, ascertained by repeated experiments, was 6 parts of calcined fire-clay, 4 parts of rough stuff, ground fine enough to pass through a grating of $\frac{1}{2}$ in. gauge, and $1\frac{1}{2}$ parts of unburnt ground fire-clay, thoroughly sifted together. The use of calcined clay for fire-bricks, except for special purposes, was found to be too expensive, and the proportions ultimately adopted were 6 parts of unburnt ground fire-clay to four parts of rough stuff, half $\frac{1}{2}$ in., half $\frac{1}{4}$ in. gauge.

FURTHER EXPERIMENTS.

On trying the above mixture with calcined clay in the cupola furnace, it was found to stand very well for ten meltings; in fact, to be practically indestructible, except round the blast hole, which required repairing every two or three meltings. The only fault found with the fire-clay cement so mixed, was the difficulty of repairing, as it burnt into so very hard a mass that it was almost impossible to chip it out, or break it even with the heaviest iron bars.

PRESSED FIRE-BRICKS.

The fire-bricks made in the manner last above described, stood the various trials they were subjected to remarkably well, except showing a tendency to crack and flake off if exposed to blasts of cold air, when heated red hot, as in the arches over the fire-holes of stoneware kilns during stoking, the roofs of puddling furnaces, and the angle piers of furnaces for heating large forgings. It was determined to try the effect of consolidating the bricks by pressure, and for this purpose some fire-bricks were made and pressed in the hand press used for pressing fan-bricks. Some of these bricks were pressed and experimented upon with greatly-improved results. But it was found so difficult to catch the bricks exactly at the time when they were hard enough for the press, that the process had to be given up. If the bricks were too hard, they cracked in the burning, if too soft they were too large for the press. The waste by this process was more than 40 per cent. It was then determined to procure a machine which would

press clay, pugged very stiff, and mould it into bricks. Experiments were carried on at the same time in mixing the clay and rough stuff, as the more thoroughly they were mixed the better the bricks seemed to be. Hand sifting with a fine sieve did very well for the fine stuff, but not for the coarse, and the best way was found to be to pass the clay and rough stuff under the runners and through the gratings a second time.

THE NEW LAW COURTS.

WHAT is meant by the agitation against Mr. Street's design for the New Law Courts? Evidently something serious, or how else can be accounted for the attitude of the leading journal, and the almost unanimous expression of opinion by correspondents in the same organ against Mr. Street's design? Last week we reproduced some of those letters, and since then others of a similar character, all more or less bearing on the same point—namely, the unfitness of the proposed design—have appeared. The *Times* appears to have made up its mind on the matter. It says, in a leading article, "Mr. Street's design is entirely unsatisfactory, and as unworthy of acceptance as the original scheme he was set to amend." Mr. Cavendish Bentinck and Mr. Alfred Seymour, who may be regarded as representing, to some extent, opinion on both sides of the House of Commons, send letters asking for a reconsideration of the matter. Mr. Bentinck says: "Mr. Street's designs were not exhibited in the library of the House of Commons until so late a period in the season that any debate upon them was out of the question." Mr. Alfred Seymour follows suit. But these individual expressions of opinion would not amount to much if it were not known that the Chancellor of the Exchequer does not approve of Mr. Street's elevations. In fact, he has said as much in the House of Commons; and it is rumoured that Mr. Gladstone is favourable to a new competition, on account of the reported prevalent hostility to the proposed designs. We know that Mr. Ayrton, professing no art knowledge, says he is prepared to be governed by the opinion of the Government art advisers; and we also know the declared opinion of Mr. Fergusson, who acts in that capacity. We offer no opinion now on the advisability of a new competition, or the substitution of another design for the one proposed by Mr. Street; we only for the moment indicate the movement of the tide. At all events, it is not unlikely that the Government will suspend operations until the re-assembling of Parliament.

LEEDS SCHOOL OF ART.

THE annual exhibition of works produced by the art students at the Leeds School of Art was opened on Saturday. Some of the best drawings executed in the school during the year are not shown, many having been retained for the exhibition of the Science and Art Department. There is a large number of drawings in shade from the east and from the flat. As might be expected, these form the chief feature in the exhibition, light and shade representing nearly all that can be attempted by night students, and being a branch of art which is greatly favoured by the authorities in London. At the same time it is clear that the operations of the school do not lack variety. A former successful student and a Queen's prize-taker (M. Allaun) has, for instance, a series of admirable water-colour studies, and there are other specimens from the same pencil at South Kensington. There is also a number of promising efforts in colour by some of the day students—notably by Miss M. E. Davis. Miss M. Metcalfe has her name attached to an exquisitely-painted design for a fan, the work being executed on silk. In addition she has contributed a design for a tea-service. From Miss A. Myers there are some very successful paintings from the flat—a description of work in which she has already obtained honours. A fine specimen of shading in red and black chalk, after Mulready, has the name of M. A. Atkinson attached to it. The specimens of shading from the cast and the flat are generally well done, as well as numerous. Those bearing the names of Miss A. M. Langley, T. W. Pottage, H. Robinson, G. A. Fox, J. Pratt, and J. Foster, are possessed of much merit. Two good paintings from the flat have been executed during the year by Miss E. Snellgrove and W. Millard, and a pleasing out-

line of foliage from nature has been produced by T. Watson. The exhibition comprises upwards of 200 works. It closed on Wednesday, when Mr. Walter Smith, the late Head Master, left Leeds to fill the important Massachusetts appointment which he recently obtained. The school is now under the management of Mr. Andrew Stevenson, who conducted the classes with Mr. Smith for some time after the institution was established, and who lately has done much in the way of art instruction at the Keighley Mechanics' Institute.

LYTHE HILL, HASLEMERE.

ONE of our lithographic illustrations this week represents Lythe Hill, Haslemere, Surrey, recently built under the architectural superintendence of Mr. F. P. Cockerell. We shall in a week or two give another illustration of the building, with a ground plan, and at the same time give some additional information as to the building materials, &c., used.

MASTERS AND WORKMEN.—NEW ACT.

ONE of the last Acts printed (Criminal Law Amendment, 34 and 35 Vict., c. 32) was to amend the criminal law relating to violence, threats, and molestation. The penalty now for threats, molestation, and obstruction may be imprisonment with or without hard labour for a term not exceeding three months. The acts specified are, violence to any person or property; to threaten or intimidate any person in such a manner as would justify a magistrate in binding over a person to keep the peace; to molest or obstruct any person with a view to coerce such person, being a master, to dismiss or to cease to employ any workmen, or, being a workman, to quit any employment, or to return work before it is finished; being a master not to offer, or, being a workman, not to accept, any employment or work; being a master or workman, to belong or not to belong to any temporary or permanent association or combination; being a master or workman, to pay any fine or penalty imposed by any temporary or permanent association or combination; being a master, to alter the mode of carrying on his business or the number or description of any persons employed by him. To molest or obstruct another person is to persistently follow him from place to place, to hide tools, clothes, or other property, or to deprive him from the use thereof; or if he watch or beset the house or place where he resides, &c., or if with two or more persons he follow in a disorderly manner such person. The Statute recites the legal proceedings to be taken, and the definition of terms to be used.

NEW ALTAR AT S. PETER'S (ROMAN) CATHOLIC CHURCH, STALYBRIDGE.

THIS altar was opened with a full choral service by the Bishop of Shrewsbury, on Sunday, the 10th inst. The table, which is of Sicilian marble, is supported by four green marble columns, with carved caps and bases in Caen stone, the intermediate spaces being richly panelled, and containing figures of angels. From the centre of this table springs the tabernacle, which is of coloured alabaster, with metal door inlaid with crystals, and guarded by two angels carved in white alabaster. The throne consists of an open niche, with a canopy supported by red marble columns, and is richly crocketed. The reredos consists of an arcading in the centre of pointed-headed panels, with sunk quatrefoils in spandrels, and a richly-carved cornice. The two outer ends consist of buttresses, with clustered marble shafts, and carved caps that are surmounted by two tiers of niches. The lower ones have angel figures, bearing the symbols of the Crucifixion; the upper canopy, which is also supported by marble columns, and finished with a rich and crocketed pinnacle, has the figure of a kneeling angel inside the centres between these buttresses. Immediately over the reredos is formed a gable, richly crocketed and moulded, and containing a life-sized group of our Lord, supported by the two Marys, S. John, and the Centurion. The final above these consists of the pelican and young. The stone used for the sculpture and moulded work is of Caen, Painswick, and Bath stones. Mr. Edmund Kirby, of Liverpool, is the architect; the whole of the work has been executed by T. R. & E. Williams, of Manchester.

THE LATE MR. GROTE.—A bust of this celebrated historian is to be placed in Poets'-corner, Westminster Abbey. The commission has been entrusted to Mr. Charles Bacon.

DETAILS, FROM VIOLET-LE-DUC 'DICTIONNAIRE RAISONNÉ L'ARCHITECTURE'

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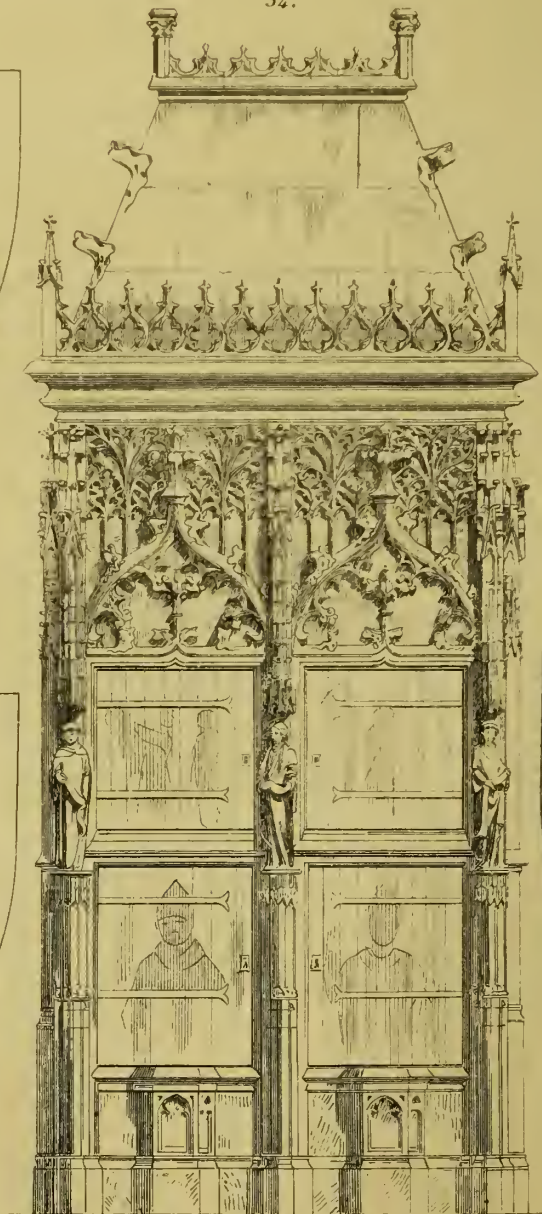


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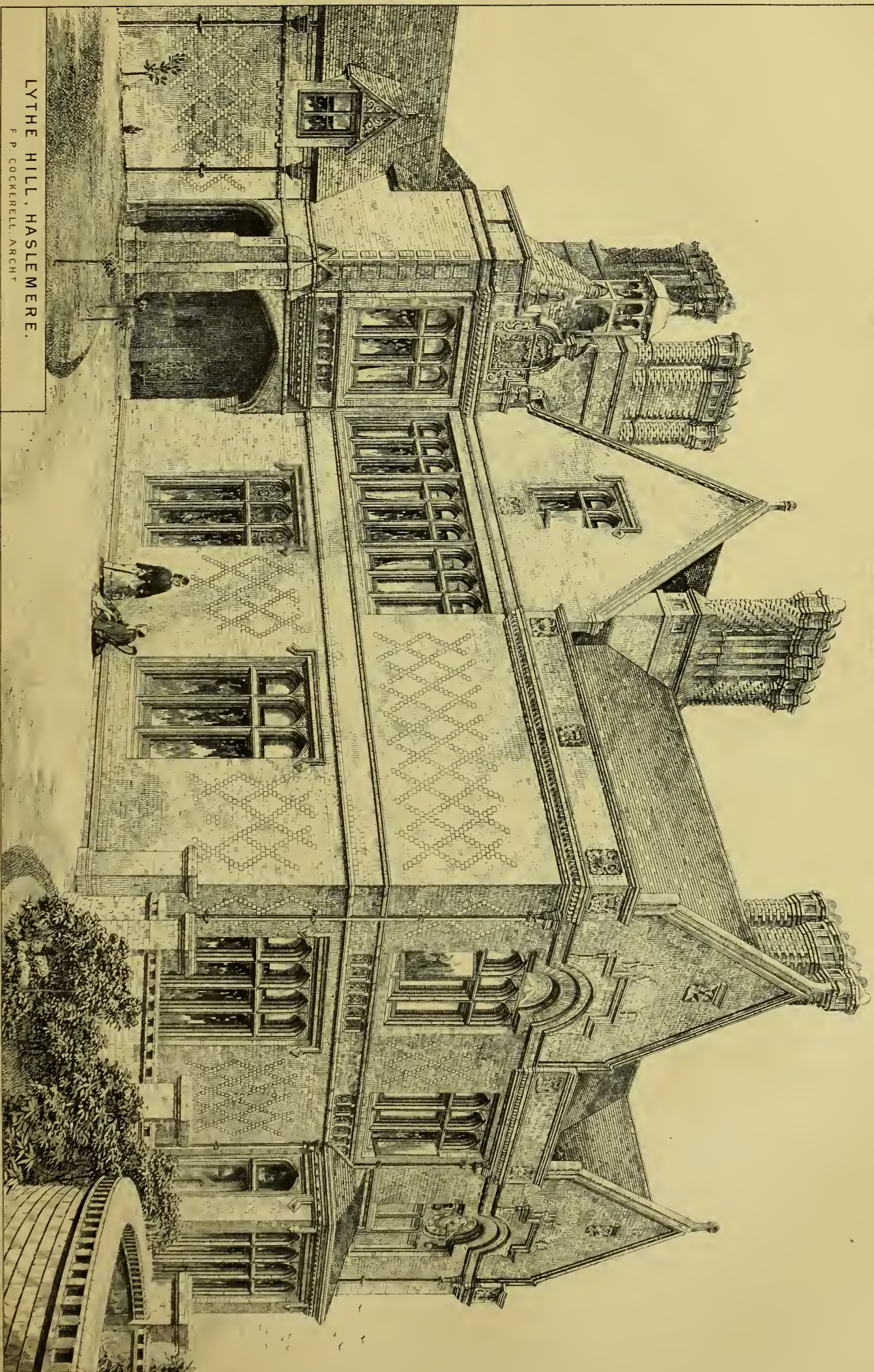
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LYTHE HILL, HASLEMERE.

F. P. COCKERELL, ARCHT.

REPORT ON THE PRESENT STATE OF DESIGN, AS SEEN IN THE MANUFACTURES IN THE INTERNATIONAL EXHIBITION OF 1871.*

By RICHARD REDGRAVE, Esq., R.A.

(Concluded from page 183.)

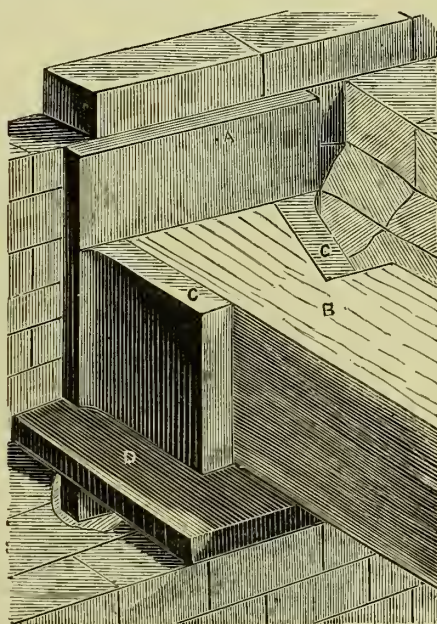
OF works in the second class, that wherein the production of a piece of ornamental furniture is the object, the most prominent is the walnut-wood sideboard designed by Mr. M. Rogers. Its description, as "with richly-sculptured trophy, representing hunting and fishing," serves at once to classify it. It is architectural in its treatment, large in style, and in good proportion, with solid columnar supports, boldly projecting mouldings and cornice, curved pediment, and other motives so common to Renaissance furniture. The carving is skilful, both in design and execution. This sideboard, in former exhibitions, would have been thought modest and subdued in its decorative features, but it now stands as representative of the class of ornamental furniture, and enables us to compare the growth of a taste for simplicity of form and constructive utility in such works. In the same group is the ebony cabinet designed by R. Jefferson (No. 3058). It is beautifully executed, but the design has all the faults of French Renaissance—false construction, heavy mouldings, unnecessary niches, and useless columns. The ebony cabinet designed by A. Lorimer has a transitional look, with some of the stock Renaissance motives of entablatures stilted on the top of columns, broken pediments, &c.: it nevertheless is, in parts, simple in its construction, while the projections are not too pronounced. The ivory inlay is well designed, and in good ornamental taste, its fault being that it is redundant, and, from its being distributed over all the constructive parts, instead of confined to panels and large surfaces, it looks too flimsy and web-like.

While on this subject, it may be as well to remark on some faults in the application of marquetry and inlays, both of wood, of ivory, and of metal. An examination of inlaid furniture shows the errors to which the designer is liable. These may be described as—First, when the contrast of the materials is too violent—Second, when there is insufficient contrast between the inlay and the material inlaid—Third, when inlays are inserted in unsuitable materials—and, Fourth, when the ornamental inlay is in excess. The design of the ornament when ebony is inlaid with ivory, or in any strongly contrasting materials, should be very perfect in line, and pure in its general forms, the very strong contrast between the two materials calling attention to any false curve or unpleasant grouping; if it is in too great quantity, or spread too much over the whole surface of the work, a want of breadth and repose is the result. On the other hand, if the wood, or other material in which the inlay is inserted, is too much alike, in colour or tone, to the inlay itself, the labour bestowed by the inlayer may be thrown away, or, at least, be less effective than it ought to be. There is a little sense of this fault (certainly a fault on the right side) in the inlaid furniture designed by Mr. R. Charles, of which mention has been made. Thirdly, when inlays are inserted in an unsuitable ground, the effect is equally lost, as in the piano exhibited by J. Brinsmead & Son, where the configuration of the grain of the wood mars the effect of the inlay, and, joined to the saw-cut ornament, disturbs the eye by the multiplicity of forms, and destroys all sense of pleasurable repose. The skilfully-designed inlay or marquetry of the table by Mr. C. Slocome, belonging to the Duke of Northumberland, may be referred to as an example of excess. Not only is the whole surface of the table too much covered by the decorative border and centre, but the want of repose thus arising is increased by the redundant curves and busy fulness of subject in the marquetry; while the flat treatment which ought to be the rule in inlaid work is violated by bands and foliage passing under and over one another, and by the sense of ornamental relief given by contrasting dark and light woods. Thus, while the ornament is full of fancy, and of high skill and merit, the principles that should govern inlays are not so well attended to as they are in the excellent inlaid table of Mr. Jacob, or in that of Mr. A. Lorimer. It has already been said that redundancy often arises from ready means of execution. This may account for a little excess of ornament on some simple pieces of furniture designed by Mr. A. F. Brophy, and on which a new process of staining wood has been used to supply the decoration. Subdued, and need with more restraint, the process seems to supply an agreeable mode of cheaply ornamenting works of this character.

Having thus reviewed some of the most important objects embodying design, it has become evident that, partly from the effect of former Exhibitions—by the spread of sound criticism, and deduction of principles from the examination of fine works—much progress towards excellence has resulted; and not only has invention, controlled by sounder taste in its application, been stimulated, but the extravagant *tours de force*, the efforts after startling novelty, and to produce works of great size or curious difficulty, rather than of utility and beauty, which crowded our first International Exhibition, are far less resorted to by our designers or manufacturers to secure the applause of the public.

ANCHOR BEAM SUPPORT FOR BRICK WALLS.

WE illustrate from an American paper a method of supporting and anchoring beams to brick walls, invented and patented by Wm. W. Goodrich, of Rondout, New York. The method consists essentially in casting the supporting and anchoring devices together in a single casting, the parts of



which are as follows:—A is a vertical flat plate, which is placed between the outer course of brick and the inner ones. The beam, B, rests upon a horizontal plate, D, cast with the vertical plate A. The end of the beam is dovetailed as shown, the dovetailed portion fitting the recess between two vertical plates, C, cast together with A and D. In this way the plate is anchored to the wall, and the beam is firmly held to bind opposite walls together.

METROPOLITAN IMPROVEMENTS.

METROPOLITAN BURIAL-GROUNDS.—At the last meeting of the Whitechapel District Board of Works, a letter was read from Mr. Hopwood, Clerk to the Holborn District Board of Works, asking for the co-operation of the Board in an attempt which it was proposed to make, through the Metropolitan Board of Works, for obtaining Parliamentary powers to appropriate the whole of the closed burial-grounds in the metropolis as recreation-grounds for the people. The matter was referred to the Works Committee.

PROPOSED IMPROVEMENTS AT WAPPING HIGH-STREET.—The special committee of the Whitechapel District Board of Works, appointed to confer with the authorities of Limehouse and S. George's-in-the-East with reference to the proposed widening of thoroughfares from Wapping High-street to Little Tower-hill, have reported in favour of the scheme, and recommended that a deputation be appointed to wait upon the Metropolitan Board to support the carrying out of the same.

ANOTHER RECREATION-GROUND FOR EAST LONDON.—The large open space known as Stepney-green having of late fallen into a neglected condition, its enclosure has been the subject of considerable agitation, and at the instance of the Mile-End Old Town Vestry, the Metropolitan Board of Works have consented to expend £3,000 in converting it into a place of recreation and a flower garden for the use of the public. Stepney-green is said to be the last remaining remnant of the once

famous Mile End-green, the trysting-place of City archers, and the rendezvous of the Essex rioters in 1381. The lord of the manor of Stebunheath has granted Stepney-green for the free and perpetual use of the people as a recreation-ground, and, except in regard to the expenditure for enclosure and culture, this large open space, which contains many noble trees, will have been secured to the public free of cost. The work is being rapidly proceeded with, and the ground will be ready for the reception of the public early next spring.

THE CHELSEA EMBANKMENT.—The *Athenæum* understands that it is intended to erect the granite parapet of the Chelsea Embankment in a plain and solid line, as a work in that material should be, and not after the fashion of the northern and southern embankments, which comprise trivial balustrades of the order which is named "footmen's calves," with mouldings which are suitable to sandstone and limestone, but not to granite. The cost of working the balustrades and mouldings for the northern and southern embankments was enormous, and added prodigiously to the outlay on these works. It was a pure waste of money. A plain and solid wall, coped or chamfered at the top, serves best for a granite parapet. The face of an embankment in that material must needs become grand, especially if wrought on a large scale, when it exhibits such a parapet as this, with a slightly battering water-wall, and a bold torus moulding at the level of the roadway within.

ARCHÆOLOGICAL.

LAKE DWELLINGS ON THE SHORES OF LOCH ETIVE.—Dr. Angus Smith, of Manchester, who has been exploring in a large moss on the shores of Loch Etive for a few weeks back, has discovered the remains of a lake dwelling, the platform of which is 60ft. in diameter, with the dwelling in the middle 50ft. in length by 28ft. in breadth. He also discovered in a large cairn a megalithic structure, consisting of two chambers, each 20ft. in length, connected by a narrow passage nearly as long. The Rev. R. J. Malleton, of Dumbarton, who along with several others, has visited the remains, believes no other cairn like it has been as yet discovered in Scotland. It allies itself, he thinks, more to that of New Grange, in Ireland, than any other, although it is much smaller. One broken urn and the remains of four others were also discovered.

WILTSHIRE ARCHÆOLOGICAL AND NATURAL HISTORY SOCIETY.—A Wiltshire paper says:—The committee of the above society, having in view the recent congress of the Archæological Institute of Great Britain and Ireland at Cardiff, within easy reach of this county, and the more recent gathering of the Archæological Association of Great Britain in the still nearer county of Dorset, have exercised a wise discretion in abandoning their intentions to hold a general meeting this year. The more zealous archæologists of our county, must, therefore, curb their antiquarian impatience for another twelve months, for it is not without prudence that the officers of our Wiltshire Archæological Society shrink from summing their members with too large a dose of antiquities; and, after their successful and largely-attended gatherings of late years, decline to run any risk of summoning an assembly of the members to which they might, perhaps, respond with less than their usual ardour.

THE NATIONAL GALLERY.—Is it going too far, asks the *Guardian*, to suggest that, at least pending the erection of the additional gallery, a certain number of the Peel pictures should be removed and replaced with many more pleasing ones which at present adorn the cellars and secret stores of the department? In the arrangement of the collection the greatest names have been placed on the line, irrespective of subject, so that some of the most disgusting examples of the coarsest Dutch school are made prominent, while some much less objectionable if less valuable pictures are skied. We may also take this opportunity of asking if the wonderful, hideous, and expensive frame which has just been placed on Cima's "Incredulity of S. Thomas" belongs already to the picture, or has been made for the purpose recently? The framing of pictures has become a fine art in itself. But the impertinence (in a parliamentary sense) of putting a coloured frame on a picture which already glows with colour most delicately harmonised is, to say the least, astonishing. But on the gaudy and tasteless frames in the National Gallery we might expatiate by the hour. Query, how many of the pictures are spoilt outright, and how many would be better without their frames?

* From the Official Report, Fine Arts Division, Part IV. Published by J. M. Johnson & Sons.

Building Intelligence.

CHURCHES AND CHAPELS.

BRISTOL CATHEDRAL.—The works in connection with the erection of the nave of Bristol Cathedral are progressing, though slowly. The committee have received a considerable degree of encouragement from a few friends. The ex-Mayor, Mr. W. K. Wait, who acts as hon. secretary, contributes the north porch, with the carving and sculpture, in addition to a prior benefaction. Shortly after the last anniversary, on April 21st, the committee issued instructions for completing two additional bays, which would only make four in all, and then to erect a wall in order to temporarily inclose them. This arrangement cannot be deemed satisfactory, since the beautiful north porch will be for a while disconnected from the completed bays, and a considerable expense be ultimately incurred in removing the wall. The funds required to finish the nave and towers as far as the roof of the building are about £1,000 or £1,200. A great deal might be effected by means of memorials, as there are yet six windows, four nave columns, two tower columns, and five monumental recesses which can be subscribed for by the wealthy.

CHICHESTER.—The beautiful Lady Chapel in Chichester Cathedral is being restored in memory of Bishop Gilbert, having been built by an earlier prelate of the same name, Gilbert de Seo. Leofardo. The ante-chapel has been again thrown into the building, and reveals a lateral window (now closed up) like those of Chester and Hereford. The sedilia, laver, and aumbries are restored, and the stone work is renewed in the windows.

EXETER.—The parish church of Holy Trinity, Exeter, after undergoing considerable alteration and decoration, was re-opened for divine service on Sunday week. The cost of the work will be about £300. The works were executed by Mr. Scadding, Messrs. Kingwell & Son, Mr. Bowden, Mr. Edwards, and Messrs. Mitchell & Son. A stained glass window is to be placed in the east end of the church. It is to be supplied by Messrs. Beer, of Bartholomew-street, Exeter.

HOLLINGWORTH.—A chapel is about to be erected by Messrs. S. & J. Higbam, contractors, of Harpurhey, Manchester, for the Independent connexion in accordance with designs prepared by Mr. H. Pinchbeck, architect, Manchester. The cost is estimated at about £2,000.

KIRKDALE.—The memorial-stone of a new Congregational Church was laid at Kirkdale on Tuesday. The church, when complete, will cost £5,500. It is designed to accommodate 850 worshippers. The architects are Messrs. Duckworth & Medcalf, Turlton-street, and the contractor is Mr. J. H. Mulbin, of Liverpool, the sub-contractors being Mr. R. Parry, bricklayer; Mr. J. Roberts, mason; Mr. J. Turner, plasterer; Mr. J. Sharp, plumber; and Mr. H. Moss, ironfounder.

LATCHFORD.—On Sunday week a new (Roman) Catholic school chapel, dedicated to S. Nicholas, was opened at Latchford. Its dimensions are 70ft. long by 28ft. wide, with a chancel at the north end 16ft. 6in. by 12ft., and a class-room, now used as a vestry, 11ft. 6in. by 12ft. The school is divided from what may be termed the chapel proper by large folding doors, and thus forms a room capable of seating some 200 children. The building is plain, in the Gothic style, built with brick and ornamented with blue-brick bands. As a chapel it will afford accommodation to 450 persons. Mr. Robert Curran is the architect, and Mr. Abel Pennington the builder.

LITTLE MARSDEN.—The foundation-stone of a new church dedicated to S. Luke, was laid on Saturday last, the 9th inst., by Lieutenant-General the Hon. Sir James Yorke Scarlett, G.C.B. The church will be Gothic in style, and consist of nave, aisles, and chancel, with tower and belfry at the south-east angle. It will accommodate about 540 persons, and, when finished, will cost about £2,590. The architect is Mr. J. Green, of Todmorden; and the contractor Mr. J. Parker, of Burnley.

LITTLEOVER.—On the feast of S. Bartholomew the parish church at Littleover, Derbyshire, which has undergone considerable improvement, was formally reopened. A new organ chamber has been built, and the chancel, which has been laid with encaustic tiles, is now arranged for the choir. The steps to the altar and the foot pace are of Derbyshire fossil marble. A handsome reredos of Caen stone and alabaster, inlaid with Derbyshire marbles and spar, has been erected by Mr. Hall, of Derby, who has also in hand a new pulpit of Caen stone and alabaster. Several special gifts have been made, among which are three stained glass windows, one by Hardman, of Birmingham,

and two by Powell, of London, and an elegant brass lectern. The ancient font has been removed to a better position, and rests on a massive block of alabaster. The various designs reflect much credit upon the architects, Messrs. Stephens & Robinson, of Derby. Messrs. Seaton are the contractors. The decorations in gold and colours are by Mr. Cantrie.

OSWESTRY.—The foundation-stone has been laid of a new Congregational Chapel at Oswestry. The plan consists of nave, transepts, and side aisles, the extreme dimensions being 57 by 72ft. The tower terminates the south-west aisle, and forms an entrance, and is surmounted by a spire rising to the height of 103ft. above the street level. Accommodation is provided for 800 persons when the building is completed; and the class-rooms for about 220 children. The building will be pitched faced with Cefn stone from Messrs. Dennis & Co.'s quarries; the mullions, tracery, and facings will also be supplied by that firm. The benches and other interior fittings will be of deal, stained and varnished. The contract for the work has been taken by Messrs. Morris & Chaplin for the sum of £3,500, exclusive of lighting and heating, and will be executed from the designs and under the superintendence of Mr. W. H. Spaul, architect, Oswestry.

WINDERMERE.—The ancient parish church of S. Martin's, Bowness, Windermere, has recently been restored, and enlarged by the erection of a new chancel and vestry. The entire church has been re-seated with open benches instead of the old-fashioned pews; the east window has been restored (see "Stained Glass"), and underneath it a new reredos has been erected. The reredos is of alabaster, and the mosaics are emblems of the four Evangelists, the work of Messrs. Bell & Almond, of London. The woodwork of the chancel and organ-screen is by Messrs. Brownrigg & T. T. Holmes, who have also jointly executed parts of roof, &c. The woodwork in the body of the church is by Mr. J. Holmes, executed under Mr. Blades, of Lancaster. The whole of the work has been done from plans by and under the direction of Messrs. Paley & Austin, architects, Lancaster. The new chancel was dedicated on Thursday week. —S. Mary's Church, Windermere, is being enlarged by Mr. R. Atkinson, under the supervision of Mr. Cunningham, architect, Liverpool.

BUILDINGS.

BOHEMIA.—New schools have just been erected at Bohemia, near Hastings. The buildings are of red brick, with Bath stone dressings, and open-timbered roofs are constructed for the school rooms. Messrs. Jeffery and Skiller, of Hastings, were the architects. Accommodation is provided in the mixed school for 150 children, and in the infant division for 100 children. Mr. G. Bridgland, of S. Leonard's, was the builder.

DEAL.—Newly-erected schools, situate in Middle-street, Deal, in the county of Kent, were formally opened on the 30th ult., by the Very Rev. the Dean of Canterbury. The buildings have been erected from designs prepared by Mr. William E. Smith, of Upper Bedford-place, London. Messrs. Gibbons & Cohens, of Deal, have most admirably executed the works, which have amounted, including the purchase of the additional site, to about £1,000. The boys' and girls' schools are each 40ft. long by 20ft. wide, and each school has a good class-room. The style adopted is plain Gothic, in red and yellow brickwork, with stone dressings, and open timber roofs, stained and varnished. Ample playgrounds are also provided.

HOLMFIRTH.—The opening of S. John's new schools, Upperthong, took place on Thursday week. The buildings are from the designs of Messrs. Joseph Barrowlough & Sons, architects, Holmfirth, and cost £1,150.

LIVERPOOL.—The Earl of Derby on Monday laid the foundation-stone of the new Seamen's Orphan Institution at Liverpool. The new building, the designs for which have been furnished by Mr. Alfred Waterhouse, will have its principal frontage facing south-west, and nearly 300ft. in length towards Newsham Park. At the southern extremity of this principal façade, and in advance of the rest of the building, will rise a tower 25ft. square and about 120ft. in height. The materials used will be gray bricks, with red Runcorn stone dressings. Over the window heads, which are generally square, there will be relieving arches in red brick, and at the eaves of the roof a cornice of the same material. The building will be generally four stories in height, and consist of a main block running parallel with the road, and at either end a wing at right angles with the main block. There will be accommodation for 200 boys and 100 girls. The cost of the entire structure will slightly exceed £20,000. The general contractors are Messrs. Haigh & Co.

NOTTINGHAM.—Large additions have been made to the premises of Messrs. Charles Cox & Son, lace bleachers and dressers, of London-road, from plans by Mr. Berridge, architect, of Bishopsgate-street Within, at a cost of about £16,000. With a vast amount of plain façade to deal with, it has been the aim of the architect, by the introduction of different coloured bricks, to obviate the monotony which, under similar circumstances, architects have generally avoided by a resort to projections. The contractors were Messrs. R. Dennett & Co., of Nottingham and Whitehall-place, on whose fireproof method the principal floors are constructed.

THORN.—The corner-stone of a new Wesleyan school was laid at Thorn, Lancashire, on Saturday week. Messrs. Russell & Whitaker are the architects, the contractors being: Ellis & O'Brien, mason work, &c.; Sutcliffe, Brothers, joiners' work; Rushton, slating; Pilling, plastering; and Clegg, plumbing, glazing, and gas-fitting. The total cost will be about £2,000.

LEGAL INTELLIGENCE.

THE CITY COMMISSIONERS OF SEWERS AND TRADE REFUSE.—At the Guildhall Police Court, last week, Mr. Douglas Straight, M.P., applied for a summons against the Commissioners of Sewers, under the 11th and 12th Vict., cap. 163, sec. 82, for refusing to remove the ashes which they, as scavengers, were bound to take away free of cost. He said he made the application on behalf of Messrs. Compton & Co., army clothiers, of Aldgate. Messrs. Compton, in their business, used a small steam engine, which formed clinkers, and which they contended the scavengers had a right to take away. The Commissioners of Sewers, however, who were their own scavengers, refused to remove them, on the ground that they were trade refuse, and it was to recover penalties for that refusal that he applied for a summons against them. Mr. Martin, the chief clerk, said that this question had been raised before by Messrs. Pontifex, and the magistrates, after a great deal of consideration, had decided the question against them. Mr. Straight said he was glad that Mr. Martin had mentioned that, because there was a decision by one of the metropolitan magistrates to which he was sure Alderman Sir Thomas Gabriel would give great weight. He then read a judgment given by Mr. Cooke, at the Clerkenwell police-court, in which the contractor, Mr. Dodd, summoned Messrs. Eley, cartridge manufacturers, of Gray's-inn-road, for payment for removing the clinkers from their furnaces, and the decision was against the contractor, clearly showing that they were not trade refuse, and that the scavenger was bound to remove them without payment. The clerk said that the Act of the Commissioners of Sewers was a different Act to that which the metropolis was governed by. By the 6th section of the Act for the City, the Commissioners of Sewers were to decide what was and what was not trade refuse. Alderman Sir Thomas Gabriel said if that were so there was an end of the case. Mr. Straight said if it were so there would be, but he was not aware of it. The Act was then referred to, and it was found that the sixth clause did give that power. Mr. Straight said it was very important that that should be publicly known, and the sooner the clause was altered the better. Alderman Sir Thomas Gabriel said it was clear the Act gave that power to the Commissioners, and they could not alter it. There was, therefore, an end of the application.

STAINED GLASS.

SOUTHAMPTON.—The workmen of Mr. Orr, stained glass artist, have during the last week been engaged in erecting in the apsidal chancel of St. Laurence's Church, Southampton, three stained glass windows. The windows are lancets, the figures of SS. Laurence, Michael, and John the Divine occupying the middle of the design, which is filled top and bottom with a bold diaper pattern.

WINDERMERE.—The east window of the ancient parish church of S. Martin, Bowness, Windermere, has recently been restored by Messrs. Ward & Hughes, of London, under the supervision of the Secretary of the Society of Antiquaries, C. Watson, Esq. The window is famous for containing portions of the ancient stained glass window formerly belonging to Furness Abbey.

PARTIAL SUFFOCATION BY GAS.—A remarkable instance of partial suffocation through inhaling gas occurred at Pendleton on Monday. A man and his wife, named Vickers, were not seen by the neighbours at the usual hour, and their house was broken into to ascertain the cause. They were found apparently lifeless, and the house smelling strongly of gas. A three-inch gas pipe had burst underground, immediately in front of their dwelling, and the gas having found its way into the house was inhaled by the unconscious sleepers, producing asphyxia. But for the prompt action of the neighbours, their sleep would have proved the sleep of death.

TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

Correspondence.

NOTES ON CARPENTRY.

To the Editor of the BUILDING NEWS.

SIR,—The method of securing the foot of the principal given by "C. E." in last week's BUILDING NEWS does not seem to me to be so good as that given in "Notes on Carpentry," for the following reasons. But first I must notice that "C. E." misreads the article, inasmuch as he says "the thrust of the foot of the principal is horizontal, not perpendicular to its back, as implied by the direction of the bolt"; but in your article it is expressly stated that the bolt is employed merely to keep down the foot of the principal to its place in the notch, and that the thrust is borne by the timbers alone, and not by the bolt. In the method given by "C. E." the thrust is borne by the bolt alone, thus being directly opposite in principle. Now to determine which is the better method it is necessary to establish a few data with which to compare the proposition, one of which is that in any structure it should be as nearly of homogeneous material as it can be made—that is to say, it should not consist in one part of a very strong material, and in others of a comparatively weak one, unless reasons of economy exist for the variation; therefore if a timber structure can be so framed that the pieces come together, wood to wood, it is better than wood on one side and iron on the other, for the essential parts of the structure are not then homogeneous. In the other case the essential parts are homogeneous, and form an abutment of timber upon timber in the direction of the grain, the extent of bearing surface being proportioned to the thrust upon it, and the iron strap being only introduced to keep the two pieces of timber in their respective places, sustaining no part of the strain, except in case of decay of the timber, in which case it would be a safeguard. The abutment of this joint, it will be seen on reference to the figure, is not that of a mere tenon, but is a shoulder having a considerable bearing surface, and the settlement mentioned by "C. E." is that caused by the weight of the principal, collar beam, and queen-posts, which brings these bearing surfaces at once into contact when the frame is erected, and it is not until this final settlement takes place that the straps are screwed up.

Now in the iron strap or bridle shown in the figure given by "C. E.," the whole thrust of the principal has to be sustained by it, and that thrust is thrown transversely across the bolt that passes through the tie beam, and by which ultimately the whole strain is borne; but to put a cross strain on a bolt which passes through any material less hard than the bolt itself is to bend it. If, indeed, the bolt pass through iron, so that it has a firm bearing, it will resist a shearing strain to the extent of its sectional area, but to pull crosswise against a bolt which passes through timber is to bend it, however closely it may be screwed up.

The strain might not in this case be sufficient to cause the bolt to bend much, but it is of the principle of construction that I speak, and the whole tendency of the weights is to cause a distortion of the frame by bending this bolt.—I am, &c.,

A. I. C. E.

THE SLUMS OF LONDON.

SIR,—The public prints teem just now with notices and descriptions of the habitations of the very poor in this metropolis, showing that they are the nurseries of dirt, disease, and profligacy in every possible form, for which various remedies of little probable efficacy are suggested as a cure for this great evil. It would appear that, generally speaking, all our blind alleys and courts, sinks of dirt and iniquity, stand upon land held on building leases mostly from noble owners. Now no man is allowed by law to create a nuisance to his neighbours, under severe pains and penalties. How does it happen, then, that noble owners can set up and maintain such nuisances with impunity? For as they

refuse to sell, and will only let their land on building leases for a term of years, at the expiration of which all buildings thereon revert to themselves or their descendants, they are in law the *bonâ fide* proprietors. Let them sell their land out and out freehold if they wish to be free from blame. As it is, it is inconceivable how noblemen and gentlemen possessing immense revenues can condescend to derive a large portion of them from such filthy sources.

The assertion frequently urged that it is not immediately the fault of the superior landlord, is a gross fiction, as well as that the mischief is entirely caused by the universal custom of subletting—a fact that has nothing to do with the law of the case.

The system of letting land on building leases for a term of years has ever prevented our architects and builders from producing really handsome and permanent buildings, and it is a great national disgrace that the Albert Hall of Arts and Sciences actually stands upon leasehold ground. It is even hinted that the new Palace of Westminster is built upon land the property of the noble Marquis.

This system of ours of building leases, unknown to foreigners, may well cause them to describe us as a nation of petty shopkeepers, and if ever England should fall into decay, as predicted in the humorous tale of the "Battle of Dorking," one of the main causes will be this system of building leases.

The remedy for this overcrowding in courts and alleys most frequently suggested is to build palatial residences, divided into flats for four families each, and five or six stories high, an expedient that carries absurdity upon its face. The very poor—in fact, precisely those we wish to dislodge from their filthy domiciles—do not, and never will, inhabit them. Four families, with all their children, confined to one flat, with no outlet except the public staircase, is an outrage upon human nature. The six-story system puts too many souls upon the ground plot, so that each individual has only about three square yards to his own share of the earth's surface. The six story is also a mistake in regard to fatigue, for in going to and fro, the labourer might just as well have his residence six or seven miles from his place of business.

The opening out grand new streets through crowded districts is no cure, the result being merely an increased density of population immediately behind. The question, therefore, of how to clear out the slums of London still remains unanswered, and will so remain until land can be bought and sold as other goods, and the legal fiction of selling land on building leases be rendered impossible.—I am, &c.,

Reading.

PUBLIC FUNERAL OF M. DUBAN.

SIR,—The announcement made early in the last session of the Royal Institute of British Architects of the death of its distinguished Hon. Fellow, M. Duban, will be fresh in the memory of most of your readers. The Institute being now in vacation, I desire to make known through your columns to our scattered members the intention of his French colleagues to give a public funeral to their great *confrere*, at which it is desired that foreign architectural bodies should be represented. The funeral is to take place at Paris on the 7th of October, and as it is probable that many of our members will be travelling at that time, it is hoped that the Royal Institute of British Architects may be well represented. I shall be glad to receive communications from any of our members who may be disposed to attend, and to secure them a proper reception.—I am, &c.,

FRED. P. COCKERELL,

Hon. Sec., Royal Institute of British Architects.
18, Manchester-square, W., Sept. 11.

COVERED WELLS.

SIR,—In your issue of September 1st you mention the case of a young married woman losing her life through the sinking of the brick dome of a well, and this calls to my mind a circumstance that might have terminated fatally, but which, happily, did not. Two years ago I was staying in a house here (Seaton Carew), and one day a woman employed about the premises began to sink through the brick floor of a back-kitchen or wash-house. The mistress, fortunately passing at the time, gave the woman a push to throw her clear of the spot, and she sank only knee deep. As there was a hole, disclosing a dark cavity, the bricklayer was sent for to examine the place, and he discovered that below the floor there was a well of about 30ft. in depth. This well had, about thirty to thirty-five years before (when the house was built), been covered in at the top by stout fir planking; the exhalation from the water, with the want of ventilation, had caused the wood to decay, and the bricks of the floor, originally laid on the planks, were left to hold each other up. When I saw the place, the water appeared to be not more than

6ft. or 8ft. from the level of the kitchen floor, and, had the poor woman fallen through, the chance of her being rescued in time would have been small, as (allowing for silting) there must have been at the time nearly, if not quite, 20ft. of water in the well.—I am, &c.,

G. M.

Seaton Carew, September 6th, 1871.

P.S.—There is a well-sinker in this neighbourhood who stoutly maintains that such a covering as I have described is quite sufficient, if the wood be oak; so that, unless prevented by competent supervision, such things as the above will occur again.

HOUSE CISTERNS.—THEIR SITUATION.

SIR,—Cisterns are both good and useful in their own place—e.g., What is a reservoir but a large cistern? In many cases, however, as put up in houses, their place there is a very bad place. As happens in thousands of cases in flatted houses, it is customary to have the cistern of the one house right underneath the water-closet of the house above; and, as a consequence, when it so happens that some of the inmates of the upper house have been eating broken cups or saucers,

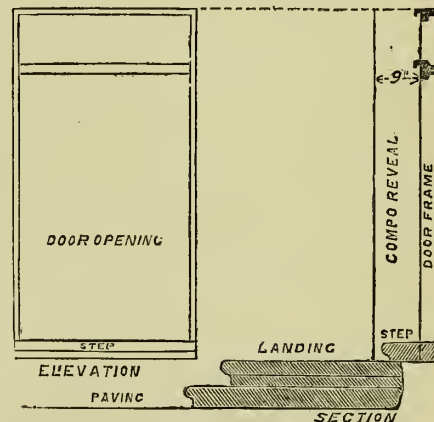
it is nothing unusual to find that the pieces, not being properly digested, choke up the soil-pipe, when down go certain savoury spices to flavour the cistern underneath, aided, perhaps, by the application of the kitchen poker, as at A. C is the water-closet cesspool of upper house; A, hole punched in it by poker; B is cistern of house beneath. What happens here is, of course, owing to the situation of the cistern, as, also, to its being unprotected at the top. In the top flat of house, or in the garret, the cistern can be easily protected; but where it is right underneath a water-closet, it is not exactly in the best of situations, especially if not very carefully protected, and if kitchen tap is off it.—I am, &c.,

P.

Intercommunication.

QUESTIONS.

[2308].—Moulded Stone Steps.—In giving an order to a mason for a moulded stone step to an entrance door, the building having a compo front with no dressings, a question was raised as to its projection. The door-frame is in a reveal 9in. from line of front,



according to sketch. Perhaps some of your readers would be kind enough to give their opinion as to its said projection—whether the nosing should project beyond line of compo front, or stand back in clear of reveals, as shown.—M. I. WRONG.

[2309].—Lead Letters in Marble.—Will some kind reader inform me of the best way to insert lead into letters cut in marble, and the best material? Also, the best mode of doing it to prevent the letters appearing ragged and uneven when finished? I have tried common milled lead, but it appears too hard. Is there any way to soften it, and what will do it? Is there any way of colouring the letters inserted of various colours, without painting?—MALVARIAN.

[2310].—Responsibility of Architects.—Is an architect responsible for extras ordered without his employer's authority? I am seeking information upon this subject, and shall be glad if some of our readers could furnish me with the details, or name of any case where an architect has been successfully proceeded against for the value of additional works, ordered without the consent or authority of his employers. I have lately heard of a case where a well-known church architect had had to pay out of his own pocket the difference between the cost at which he agreed to do certain works for, and the actual cost of the works when executed, which greatly exceeded his estimate. I am aware that an architect generally escapes the payment of such extras, which are usually borne by his client; but it is often the means of producing much unpleasantness, and architects not only injure their reputation by such acts, but render the public chary of employing them.—ARCHITECT.

[2311.]—**Supererogation.**—Does the existence of an engagement for certain hours per diem necessitate idleness before and after that period? Is an assistant, either morally or legally, bound to reject work available out of office hours, and in no way interfering with his official duties?—F.

[2312.]—**Oak.**—Will some one kindly give me an account of the nature and qualities of Dantzic oak, and the Canadian and American oaks—i. e., the red oak (*Quercus rubra*), the white oak (*Quercus alba*), and the live oak (*Quercus virens*)?—E. O.

[2313.]—**Victoria Tower, Westminster.**—What is the height of the flag-staff on this tower, and its diameter top and bottom?—H. W. P.

Our Office Table.

NEW TOWN HALL FOR S. HELEN'S.—The Town Council of S. Helen's, in order to secure a good design in their new Town Hall, decided to ask six architects to send in plans, and give the five unsuccessful competitors twenty guineas each. A long discussion took place at their last meeting on Wednesday week, on the limiting of the competition, but it was urged that it was the plan adopted most successfully in other places. The selection of the six is to be made from the following gentlemen:—Messrs. Picton, Bradley, & Co., Mr. Culshaw, Mr. Ellison, Mr. C. Sherlock, and Mr. Weightman, of Liverpool; Mr. Waterhouse, Messrs. Mills & Murgatroyd, and Messrs. Blackwell & Co., of Manchester; Mr. C. Broderick, of Leeds; and the architect of the Wigan town-hall.

A NEW YORKSHIRE RAILWAY SCHEME.—It is said to be in contemplation, during the next session of Parliament, to appeal for powers to construct a railway that will serve the towns of Huddersfield, Halifax, and Keighley, not only affording those towns a better means of intercommunication, and placing them on a direct route from north to south, but at the same time shortening the distance considerably between London and Scotland. The proposed line, which will start by a junction with the Midland and Manchester and Sheffield line, in South Yorkshire, will run through the coal fields, thence forward to Huddersfield. Thence in a direct line of about six miles to Halifax, and join the Worth Valley branch of the Midland Railway near Keighley.

NEW IRON PIER AT LAMBETH STAIRS.—Within the last few days a new iron pier, intended to serve the double purpose of giving access to the watermen's boats and also as an approach to the steam-boats, by being connected with the Embankment by the present floating bridge, has been completed at Lambeth, and in the course of the present week it will be ready for the watermen's use. The Albert Embankment has had the effect of destroying the stairs for the watermen's small boats and gigs which existed up to the time when the Embankment was formed, and this deprivation having been considered a grievance by the watermen, the Metropolitan Board of Works have erected the new pier for their accommodation. The new structure is about 12 yards square, the flooring of the pier being supported by twelve fluted columns, which rise from the bed of the river. The boats and gigs will be approached by a flight of steps about three yards in width, which have been constructed at the north angle of the pier, in connection with which there will be a spacious raft or floating stage for the several boats to rest upon.

SALES IN THE INTERNATIONAL EXHIBITION.—Manufacturers are evidently far from unanimous on the advantages of supplementary annexes to the International Exhibition (now it must be remembered a permanent institution), in which articles may be sold and taken away by the purchasers on the sole condition that the removal is effected after hours, and the vacancy filled up the next day by some similar object. This year, from some misunderstanding, only the French exhibitors availed themselves of the privilege, but next year we must expect separate annexes, constructed either by the Government or by private speculators, for almost every important country, besides a great British annexe, which will cause the whole thing to degenerate into a vast bazaar, and nothing more, unless care be taken in the management.

A GOOD CISTERN.—A writer in the *American Plan-tation* gives the following directions to farmers and others for the construction of a cistern that will keep water both cold and pure:—"Excavate in circular form (for economical reasons) to the depth of sixteen feet or more, wall up all round from bottom ten feet; at this point turn an arch for top, leaving a man-hole for the purpose of cleaning, and continue an opening or flue to the surface of the ground. The

filter can then be built on the top of the arch, or at any convenient point near it. This filter is also under the surface, and contains, first a layer of charcoal; second a layer of gravel; third, a layer of charcoal, pounded fine, not dust; fourth, another layer of gravel; then a layer of sharp sand. A filter constructed in this way will arrest all vegetable and solid matter that may be washed off the roof. Rain water, if caught in this way, then stored sixteen feet under the ground, with six feet of earth above the cistern, can develop no animal life, because the temperature is below that which brings animal germs to life.

OPENING OF A FURTHER PORTION OF THE SOUTH LONDON TRAMWAY SYSTEM.—We last week chronicled the opening of the South London tramway system from the Surrey side of Blackfriars-bridge to East Greenwich. On Monday last a further portion of the system was opened, consisting of a short length of line running from the Kennington-road along the Lambeth-road, past Bethlehem Hospital, to the Obelisk at the southern end of the Blackfriars-road, and thus uniting the Westminster, Clapham, and Brixton line with the Blackfriars and Greenwich line, thereby enabling cars to run from Brixton and Clapham to Blackfriars-bridge as well as to Westminster-bridge. In a few days the system will be further extended by the opening of the lines from Camberwell-green to Blackfriars and Westminster-bridges.

FLOATING BATHS ON THE THAMES AND SERPENTINE.—Consequent on the present agitation for public swimming baths, a company has been projected having for its object the construction of floating baths in various parts of the metropolis. The company purposes, in the first instance, to obtain the sanction of the Commissioners of Woods and Forests, the Metropolitan Board of Works, and the Thames Conservancy respectively, for the erection of a floating bath, 250ft. long, furnished with dressing-boxes, &c., on the Serpentine; also for two similar baths on the Thames, one at Chelsea, and the other below Rotherhithe. It is also in contemplation to utilise, as far as possible, on a smaller scale, the various sheets of water in the other metropolitan parks. To meet the expense of this outlay it is proposed that a charge of one halfpenny shall be made to each bather, or, with the use of dressing-box and clean towel, the sum of one penny. The promoters are very sanguine of obtaining the necessary authorisation for the carrying out of the works.

PROPOSED NEW METROPOLITAN CEMETERY AT CLAPTON.—Some fifteen years ago a proposal was brought before the public for the establishment of a cemetery in the neighbourhood of Clapton, but in consequence of the opposition it excited, the scheme was abandoned. A second attempt is now being made, under the auspices of a joint-stock company, who have selected a site within a stone's-throw of Lea Bridge-road—a plot of about 45 acres, bounded on the north by Pond-lane, and abutting on to the canal. Mr. Holland, the Government Inspector of Graveyards, visited the spot on Monday last, but his opinion as to the eligibility of the site for such a purpose has not transpired. It is objected by the inhabitants, with some show of reason, that the establishment of the new cemetery would be detrimental to the health of the locality, which is becoming more and more thickly populated every year as the various suburban railway extensions are developed and brought into play. There are already workhouses and small-pox and fever hospitals in the district, and Victoria Park, Abney Park, Tower Hamlets, and Ilford cemeteries are all within tolerably easy reach of Clapton. If an additional cemetery really is needed, it would certainly be advisable to go farther out than Clapton for its site. It is for Dr. Tripe, the medical officer of health for the district, to oppose the scheme if he considers it will prejudicially affect the sanitary condition of the neighbourhood.

THE NEW LAW COURTS.—Mr. Welby Pugin has published a long letter on the subject of the designs for the new law courts. He says:—"Let us have law courts pure, simple, and dignified; let nothing be added for the sake of effect only, but let every horizontal string, every vertical buttress, every window, and every moulding serve a purpose, and be eloquently truthful, so that the aim of art—the elevation of the human mind—may have a perfect liberty, and all may detect at a glance in this great national work an external sign of the majesty and dignity of the law." He adds that as regards the late competition, the money which has been expended will not have been altogether thrown away, for the designs taken as a whole demonstrate clearly that not a single additional fault remains to be perpetrated on paper; we therefore, at least, know what to avoid; this advantage alone ought to afford the new competitors a fair start.

CONTEMPLATED TUNNEL UNDER THE CLYDE.—Boring operations have been commenced at Clyde-street Ferry, in view of the contemplated construction of a tunnel at that point of the river. Three bores have already put down, one on either side of the Clyde, and a third within the quay wall; but it is proposed to carry the experiments a little further. All the borings will be carried to the depth of 85ft., and the results obtained up to the present time are very satisfactory, showing that, as far as the soil is concerned, the construction of a tunnel would not only be quite practicable, but easy of accomplishment. Estimates are now being prepared with the view of ascertaining the cost of the undertaking, and the revenue likely to be derived therefrom. The construction of a tunnel under the Clyde is no new idea. In 1864, Mr. Deas, the engineer of the Clyde Navigation Trustees, prepared a plan and specifications for a tunnel, which he submitted to the trust; but, although several members at that time thought favourably of the matter, it was allowed to lapse without the slightest attempt at action.

Chips.

Mr. H. W. Peek, M.P., offers a premium of £10 10s. for the best practical suggestions how to supply the great want of baths and wash-houses in Battersea, and how they can be made self-supporting if erected.

The new shaft of the Cement Works, Dovercourt, was formally opened on Friday last. The proprietor, Mr. Patrick, gave a luncheon to a select party of friends. It is hoped the works will now be unobscured.

The Ormskirk Board of Guardians last week resolved to increase the accommodation of the workhouse, at a cost of £2,000, thereby providing for 100 additional inmates, and also to erect, at a cost of £800, an infirmary for infectious cases.

The National Portrait Gallery, South Kensington, will close to-morrow (Saturday) for alterations and repairs, and will be reopened on Monday, October 2.

Wood-street, Chislehurst, which has been closed for some time, to admit of its being paved with asphalt, was opened for public traffic last week.

The Justice Room at the Guildhall has just been renovated and added to, under the superintendence of Mr. Murray, of the Architect's Office, Guildhall.

It is proposed to establish a permanent bazaar, somewhat on the model of the Lowther Arcade, at the approach to the London-bridge Railway Stations.

A Commission is to be appointed to inquire into and report upon the expediency of a proposed union of the benefices of the rectory of S. Dionis, Backchurch, and the united rectory of Allhallows', Lombard-street, with S. Benet's, Gracechurch-street, and S. Leonard's, Eastcheap.

A warehouse is in course of erection in Brazenose-street, Manchester, by Messrs. Davies & Mawdsley, Architects, Messrs. Clegg & Knowles. Cost, about £12,000.

The New Public Hall, New Mills, Derbyshire, was opened on Saturday, the 9th inst., by his Grace the Duke of Devonshire.

The Liverpool Corporation Schools are about to be transferred to the management of the School Board.

Several new works of an important character for the enlargement of the Euston Station and increasing the accommodation in various departments, which have been for some time in progress, are just upon the eve of completion.

Astley's Theatre is to be restored to its original use—that of a circus and hippodrome.

Christ Church (Unitarian), Nottingham, has been re-opened, after alterations and improvements, at a cost of £300, under the gratuitous superintendence of the architect of the church, Mr. R. C. Sutton. The church, which was built in 1863, is Geometric-Gothic in character.

Mr. W. H. Smith, M.P., has given £500 to the fund for the restoration of S. Alban's Abbey.

Mr. John Lambert has been appointed Secretary to the new Local Government Board.

The Stockport Town Council resolved on Wednesday, by the casting vote of the mayor, to purchase 17 acres of land from Lord Egerton of Tatton, as a second public park. One-half the cost is to be subscribed.

HORNSEY DRAINAGE.—The Local Board of Health for Hornsey have received tenders for the construction of an outfall sewer in connection with the metropolitan northern high level sewer, together with the works for the internal sewerage of the district, according to the plans of Mr. B. Latham, C.E. The tenders varied in amount from £33,087 to £24,521 11s. 8d., and this last mentioned, being the lowest (that of Messrs. Anderson & Dunmore, of Camden Town), has been accepted.

THE BUILDING NEWS.

LONDON, FRIDAY, SEPT. 22, 1871.

ABBEY CHURCH OF S. ALBAN'S.

THERE is great fear among those who regard with reverence our monumental fanes lest the movement for saving from complete decay—not for restoring, in the common sense of that term—the beautiful old Abbey Church of S. Alban's should fail for the want of a sufficiently munificent sympathy. And yet it is hardly possible to believe that this time-hallowed pile will be allowed to moulder, as mouldering it is, year by year, until, to the reproach of our age, it becomes another Kirkstall. But the evidences of dilapidation are only too apparent, while the endeavour to arrest the ruinous process meets with only a half-hearted support. Is it that these ancestral edifices are no longer cherished in England, and that our generation would witness without remorse the fading away of such dear relics as Grantham crypt, the Gloucester flying gallery, the beautiful Peterborough external recess, almost unique in England, or the noble architraves of Canterbury? We must imagine all this, or else we must refuse to credit the report that £50,000 will not be forthcoming out of all the wealth and piety of this nation to rescue S. Alban's Abbey Church from utter decay. Already the work of dissolution has gone too far. That structure has stood the storm and waste of more than eleven centuries; and even in its origin it was ancient, for it was built from the ruins of Verulam, a creation of Roman bricks and tiles, an agglomeration of all architectural styles, yet with a distinct design and many most imposing features; for example, the impost to the arches of the windows on the second and third stories, the northern divisions of the nave, the piers, with their many breaks, rising to the impost mouldings, and sweeping majestically round the arch, and the central tower, which, though not majestic, has much of that solemn simplicity so characteristic of our earlier builders, who were priests as well as artists. These, indeed, are among the minutest points of admiration in that shrine of sacred stone. A visit to S. Alban's, for which we would fain recover some of the love it has lost, is like reading a long narrative of innovations. The edifice is antique, and yet modern—a type, and yet a paradox. What of that old fane, which we are in danger of losing, so old that the Venerable Bede speaks of it as “a most pleasant spot, covered with several sorts of flowers,” the dying place of England's first martyr, scourged, and beheaded, and remembered or thought of to this day with affection by all who dwell within the precincts of the monastic pile? It was a little chapel once; once, again, it was threefold its present size. It was, in different periods, reputed to be haunted; it was nicknamed “The Abbey of Nightmares;” it was a scene of transitional miracles, it was so rich once that William the Conqueror thought it worth his while to rob the fat ascetics of the Verulam cloisters; its abbots were men of fame and power; but could they, who set up solid golden crucifixes, and beneath their adored canopies, see the whitewashed roof, the naked pillars, the pavement unworthy of a Parisian byc-street, the dim brasses, the golden inscriptions pass away, the chapel rifled of every Christian ornament and emblem, the great altar an anachronism, and the doorways shut except to ticket holders, what surprise would await them did they even stand where the six pedestals once stood, or where the canopy overhung the martyr's grave, or where the empty niches of the once incomparable screen are now crumbling into dust? The images of the Lord and His Apostles have vanished. We glance at the exquisite chantry, and read the question “*Quas*

iacet hic?” The answer is, “*Ille Pater, Johannes de loco Frumentario,*” and sculpture was a worshipped art in the minds of those designers, as with the men who wrought the long-neglected monument of Abbot Ramryge, on the north side of the choir, with the memorial of S. Cuthbert, the desecrated shrine of S. Amphibalus, and all the broken altars. Talk of restoration! We may prevent the lovely Abbey Church from falling into a mass of decay; but we can never revive its glory. What must it have been when the mighty beam supporting the rood-loft was one picture of superb carved work, and when every column was painted; when the two celebrated bells, christened Alban and Amphibal, were hung on Holy Thursday in 1349; and when the Lady Chapel glowed from floor to dome with gold and glitter? Well, it is not destined for any future historical records, unless a saving hand is held out to preserve even the shell, the lifeless and colourless remnant of that which was once the pride of English churches. We may do service, perhaps, by telling in what condition the Abbey actually is, and thus raising the question whether it should continue to be mutilated, miserable, and degraded. It must be remembered that not half of the sum necessary for the preservation of the Abbey Church has been collected, or even promised. Two reasons are assigned for this apathy. One is an idea entirely hostile to mere picturesque and antiquarian architectural revivals of edifices that once belonged, but belong no more, to the religious life of the nation. The antithesis of this is found in the thought that they belong to all time, and should be the objects of perpetual and affectionate care. We confess preferring the latter theory. It is not good for a country to neglect its trophies of piety and art. True, they may still retain, in ruin, their primal charm, as do Melrose, Tintern, and Tintagel. We might not even admire the great gorge of the Rhine so ardently were it not for the shattered keeps and broken battlements, whose legends make an epic of the German river, and whose towers hang like enchantments above the rocks and the stream. But we are bound, on the other hand, to cherish while it is possible the more perfect of our historic memorials, a duty understood only just in time by those who have charge of Westminster Abbey, and Ely, Gloucester, and Salisbury Cathedrals, with their stately spires—ascending far above the modest tower of S. Alban's—yet not so precious as chapters of history. It is pitiful to see its rifted arches threatening to fall, its colonnades eaten up, as it were, by moth and worm, its original level lost, the work of repair suspended through lack of funds, the pavement absolutely sinking, and all the glorious allegory of its decorations from epoch to epoch fading out of recognition. The general aspect of the Abbey Church is well known. It is in the form of a long cross, with a square and solid tower rising from the intersection of the nave and transept, and supported on four huge semi-circular arches. Perhaps it seems more dilapidated, viewed from the outside, than it actually is, owing to the effect produced by walls of Roman tiles, flints, bricks, and stones, cemented together. Still, the impression of ruin is real and strong. The peculiar coat of plaster which so long protected the tower is falling away. The battlements, comparatively modern though they are, exhibit many fractures, and much decay. Scarcely a remnant exists of the graceful flying buttresses which once adorned the south-east side, rising from the aisles to the windows of the choir and the Chapel of the Virgin, now degraded into a grammar-school, deplorably disfigured and patched; in fact, a sense of desolation haunts the entire building. The western porch is a mass of mutilation; the great pointed arched window above it resembles nothing more than the outline of a window carved by an amateur out of mouldy cheese; the exquisite diamond-work on the third range

of arches has almost wholly disappeared; some of the bearing pillars are actually gone, but the colossal character of the architecture holds the edifice together, where others, less massively reared, would have toppled to the earth in fragments. All these parts were constructed of Tottenhoe stone, very fine and close-grained, from the Tottenhoe quarries, in Bedfordshire, the rest, with the exception of the screens, the choir, and the presbytery, being of Roman tile. In one of the Norman columns, of this material, is a winding staircase, blocked up, however, by rubbish, so careful have the authorities been of their treasure. What have they done with S. Cuthbert's screen, except to splash it with whitewash, and allow it to be vandalised? What with the delicate pinnacles and cornices of the splendid Wallingford screen? What with Duke Humphrey's monument, and the gallery wherein “the monks of old” watched over the shrine of the proto-martyr? It must not be supposed, however, that all this was due to sheer forgetfulness. No; the Abbey Church, while its magnificence mouldered, received very loyal attention at different periods. The south end of the transept has been made elaborately ugly by the royal arms, emblazoned in gold and colour, side by side with pompous dedication to himself by one “Joshua Lomax, Esq.” But the curious passage which runs through the wall of the building is less cared for than an ordinary metropolitan sewer; numbers of the chapels have disappeared; the doorway which led to the upper part of the cloisters has been walled up; the singular recess in the masonry, intended for the watch-monk, might now be searched for in vain; damp is eating away the sculptured arches through which, formerly, the abbot's chambers were entered; even of the superb painted window, illustrating the martyrdom of S. Alban, only a few broken bits remain, while the inscription beneath is scarcely legible. Still may be traced, however, some little limning, which, with the aid of local lore, we can read:

“Oh, bloody fact! that whilst S. Alban dies
The murderer himself weeps out his eyes.”

It is really melancholy to pass on with only evidences of decay to greet the eye. That noble Bacchic mask, chapleted with ivy leaves, cannot last long, even as a relic. The barbarians, with their pots and brushes, have whitewashed the carvings about the abbot's door, hyænas that they are! As for the Chapel of the Virgin, it is simply a ruin, though once the most delicate and marvellous enrichment of the entire edifice. Heaven forgive the whitewashers here! They have literally boarded over the pavement. After this, does it surprise us that they have got a local builder to job a wall across the ante-chapel, as a common thoroughfare for the S. Albanites? Then with respect to the monuments. Vulgarity and profanity have done their worst upon Duke Humphrey's tomb, and even his mortal remains, which the sanctity of S. Alban's shrine could not protect. The brass image of Abbot Wethamstead, the Wykeham of his age, was stolen long ago, and melted down by a dealer. That of Ramryge, to which we have already referred, was too much of the pastry-cook order to endure; but where are the graves of Sir John Mandeville and the famous Alexander Veguam? And where the yet more celebrated writing-room? And what of the S. Alban's library, which Leland wept over? Forty years ago a scheme was projected for re-gathering the manuscripts of the monks; but the movement, both for that and for rehabilitating the structure itself, failed, and we are now witnessing a feeble effort to save S. Alban's from the fate of Kirkstall, where

“Each ivied arch and pillar lone
Pleads haughtily for beauties gone.”

The abbots here were princes in their state; kings deemed it an honour and a grace to worship in that fane; it was, and still is, though fragmentary, a Pantheon of English architecture; and it ought not to perish for

the sake of a sun insignificant in comparison with the value of this majestic shrine, so long and so often the victim of callous guardians and unscrupulous spoliators. That historian had some heart in his nature when he spoke of the brass font which was stolen in the reign of Charles I. "by one Hickman, a vile iron-monger." We have nearly done, however, with the depredators. It is more agreeable to think of that which may yet be saved. There is no hope of discovering a trace of true Saxon work in the Abbey Church, though the nave of St. Michael's, in its close neighbourhood, is unquestionably of that era. The transept and nave, judged as a whole, are undoubtedly Norman. Curiously enough, no part of the structure is set down as belonging to what it has been agreed to designate the Transitional period; though among the reparations, of course, examples of that miscellaneous epoch are found. The ponderous walls, generally constructed of small stones, the plain base-courses, the corbel tables, the parapets and copings, the original form of the windows, the cylindrical and rectangular piers, with their zig-zag, spiral, and other mouldings, the roof shafts and the side gallery vaults, tell of one predominating style. There is no real lancet-work in the Abbey; but the choir is a sumptuous specimen, ascribed to "the Geometrical period," signifying, if anything, a geometrical accuracy in window tracings, panels, and arcades. But, as we have said, this remark applies no more than generally. It is impossible to separate the mighty Abbey Church into distinct sections. It has grown like the great Indian banyan tree, and its composition is blended with a world of traditional anecdote—of subterranean passages, of hollow pillars, of prison cells long ago arched over, of sly posterns in the outer masonry, of secrets in the buttress and hiding-places in the arch, and abodes of penance, with double sets of cloisters, labyrinthine staircases, spring-doors, traps, vaulted platforms, used in the celebration of mysteries, and points of "dim espial," whence the priests made use of their power. Amid all this medley, then, we are not astonished to find a circular confronting a pointed arch, windows resembling those of Wilsford and of Winchester, relics of Norman architectural habits in the clerestory, a circular corbel in one part and a regularly-moulded cornice in another, parts of the edifice imperfectly lighted and others brilliant, pyramidal cappings to buttresses, and singular sunk ornaments on the parapets, though, strange to say, concerning so complex a structure, no ogree, no division of buttresses, notwithstanding that there are breaks into characteristic stages, no ball-flowers, and very few intricacies in the ribbing of vaults.

Now, this heritage of centuries is in the trusteeship of the living generation. Founded in 703, A.D., abolished as a monastery in 1539, and subsequently adopted by the Anglican establishment, it stands in the midst of us, an incoherent, yet a natural edifice, by no means of only local interest, as Newcombe, its too modest historian—who, however, is inexplicably meagre in point of detail—would have us imagine. No man, indeed, could be expected to compile the full chronicles of that ancient and royal foundation: We read of it in pages rusty with the dialect employed by Matthew Paris and Walsingham, in manuscripts of the Cotton Library and the Harleian collection, in papers deposited of yore in the chamber of that fearful and wonderful repository, the Augmentation Office, and—as of what else cannot the same be said?—in Rymer's "Fœdera," that catacomb of antiquities. It was first built "of timber and plank," these anchoritish authors assure us, it was sanctified by the stopping of a planet in the heavens above its roof, but it fell into direful shame. The abbots wore silk, they pledged the holy vessels of silver and of gold, they entertained large parties of ladies, purple and fine linen crept in among the fashions of the Verulam Trappists, the monks dressed and

rode like hunters, horses were stabled and dogs were kennelled within the consecrated precincts, until reforming and rebuilding were determined upon together, the brethren put upon a diet of pickled herrings, and the Abbey Church itself redecorated and restored. But those were the times in which the Abbey possessed estates the value of which has never been computed, but its accumulation of wealth was prodigious. Stripped of this it became something between a parish church and cathedral. Our solicitude is lest it should become a ruin.

DESIGN IN CAST IRON.

WE have received from Messrs. Macfarlane and Co., of Glasgow, a copy of the fifth edition of their illustrated catalogue. It is a large and handsomely-got-up work, filled with designs of various degrees of merit. We propose to notice some of these as they occur, and at the same time to make some remarks on the treatment of cast-iron generally. The first objects illustrated are rainwater pipes, and of these many different patterns are given. There are, of course, the usual round, and the perhaps more convenient half-round ones, and the square and oblong, either plain or decorated with different kinds of surface ornament. Of the latter class the best appear to us to be a round one, formed externally into a bold cable moulding, and an oblong one relieved by a delicate lozenge pattern. The worst, without doubt, is one which represents on a small scale the half of a Late Gothic pier, comprising three filleted rolls, whose capitals form the sockets required for junctions. In other examples the treatment of these sockets is original and somewhat suggestive. The designs for pipe-heads, though several tolerable ones might be selected from them, generally err in being too ornamental. They are cut up with tracery and notchings and crests and cusplings, as if they were the chief all-important features in a building, for which no amount of decoration could be too great. Of course, such faults as this are the very commonest in almost all trade catalogues. Every manufacturer wishes, naturally enough, to make his circular a showy one, and it is not at all surprising if he endeavours, not so much to render his goods an harmonious as a conspicuous part of the buildings to which they may be applied. It is the architect's business to repress this tendency. His office is like that of the conductor of a concert, who must make his musicians, according to Longfellow's description, "play with a certain modesty, and not as if each instrument were the only one in the world." In doing this he will have inevitably to reject the great bulk of patterns in almost any illustrated catalogue, and may think himself lucky, even in building a mere stable or outhouse, if he can find there so much as a rainwater head which will not be ridiculously out of keeping with its surroundings. Messrs. Macfarlane present us, not only with heads and ears for water pipes, but also with ornamental elbows and offsets. They deserve credit for having taken notice of these hitherto neglected features; the misfortune is that, as usual, they are tempted to make too much of them. They are literally crammed full of diaper and cuspling and leaf patterns; whereas the desideratum in details of this kind is a good general form, with no decoration whatever. Unfortunately, good general form is at the present day the very hardest thing to obtain. Ask for a plain and simple design, and you get one of such clumsy and shapeless ugliness as even an Australian savage might condemn. Ask for a more artistic one, and you are presented with an object whose natural gracelessness is overlaid by an amount of ornament which would suffice for a good-sized building. A piece of sensible, well-studied, unadorned work you can scarcely get anywhere or for any money; and manufacturers,

in particular, can rarely understand what is wanted when you ask for it. "There," they say, "is a plain pattern, and there, again, is an ornamental one; what more can you wish for?" What we wish for, nine times out of ten, and what we find it almost impossible to get, is a good design without positive ornament; such a design, in short, as the Greeks, the Mediæval builders, and even the modern French have produced as the natural and fitting thing whenever they were considering the subordinate details of their work. Messrs. Macfarlane's pipe-elbows and off-sets might suggest ideas for a jewel coffer or an ivory triptych, but they are decidedly out of place in connection with the drainage of a roof.

From rain pipes we go on to eaves-gutters; and here an immense variety of patterns are given. There are half-rounds, ogees of various descriptions, hollows, rounds, and semi-octagons. The last, though the least pretensions, we have several times noticed as the best in practice. Following these, we find iron gutters with a notched or cusped flange hanging from the upper edge so as to form a drip. Ornaments of this sort, unfortunately, are far less effective in reality (at least in cast iron) than they look on paper; and, apart from this, we question whether a gutter forming the top member of an eaves cornice is in the right position for being decorated at all. Even in the most elaborate Classic examples the crowning cyma of the entablature is usually left plain; and if this was felt desirable when the mouldings were in marble, it must be ten times more so when they are nothing better than cast metal. There is one form of gutter which we do not observe in the present catalogue, and one which has great practical advantages to recommend it; that, namely, which has an open railing or plain cresting attached either to its back or front edge. Such a cresting may easily be arranged to serve many of the purposes of a parapet, while avoiding its defects. While sufficiently open to offer no appreciable obstruction to the descent of water from the roof into the gutter, it may be made close enough to prevent the fall of loose slates, and to break up into powder those avalanches of snow which are liable to shoot in great masses off a steep-pitched roof. The mention of snow reminds us that snow-gratings, for the purpose of covering up gutters, are amongst the details here set forth. Our own experience has not been favourable to them. They may, it is true, keep the gutters partially or even wholly free at first, though this depends on the nature of the snow. The soft and fleecy kind will doubtless mat together and lie on the top of the grating; the small powdery variety, which is common in very hard weather, is sure to find its way through. But suppose that the snow in the first instance lies wholly on the top, the sunshine next day produces a partial thaw, and it sinks through and fills the gutter. At night it freezes again and forms a solid compact mass of ice. So far, matters are much the same as if gratings had not been used; but the worst is to come. The snow on the roof gradually melts day after day, but the ice in the gutter is actually sheltered by the gratings which were to have prevented it from forming. The sun cannot get at it, and so it remains; and with wooden gratings in a lead gutter we have known it remain for a week or more after a total break up of the frost. A cresting meant to be affixed behind a gutter, for the purposes we have noticed above, appears on page 122. This, however, involves more trouble in fixing than the smaller attached cresting we have suggested, not to say that the pattern in the present instance is something worse than unsatisfactory.

In terminals and finials we observe the usual authemion or Greek honeysuckle, which reminds us that the style to which we owe our National Gallery and our British Museum still flourishes in Scotland. There are also a number of what appear to be Gothic finials,

from which, even if we had no other means of judging, we might conclude that the Mediæval style does *not* greatly flourish there. There are, indeed, somewhat better specimens of it elsewhere in the book; but an unfortunate tendency is manifest to copy too closely forms that are characteristic of wrought metal. The ironfounder has much more to learn from the bronze doors and candelabra and other cast work of the Middle Ages than from the wrought-iron hinges and crests; and yet the first class of subjects is almost universally overlooked, and the second almost universally copied. We agree with the belief expressed in Messrs. Macfarlane's preface, that design in cast iron has possibilities of further development; but in trying to develop it there can be no doubt that it is cast work, and not wrought, which we should make the object of study. We are not, of course, recommending that cast iron should be made to pass for bronze; we simply say that the best ancient specimens of bronze work will guide us far more towards a right treatment of it than even the finest examples of wrought and hammered iron. The Greek finials and acroteria before referred to have at least this merit, that they are more characteristic of the material than the Gothic ones, and many of them have obviously been suggested by works in bronze. Amongst the horizontal railing patterns, too, there are some in which the qualities of the substance employed are fairly exhibited. Such is that (No. 438) at the bottom of page 245, consisting of a kind of guilloche filled with an eight-leaved conventional ornament. The form is pleasing, and the effect is one that could only be readily produced in cast metal. A pattern, on the contrary, like No. 40 on the opposite page, is a mere imitation of a wrought-iron design. Not only is the slenderness of its parts unsuitable for a comparatively brittle substance, but it shows the very bands and ties which a smith would apply to connect the different portions of the design. It is, in fact, a sham, while No. 438 is a reality. No. 160, again, on page 295, strikes us as being, if not quite successful in the details of its form, at least adapted in its general conception to the material. It consists of a square panel, inclosing a circle, across which run two diagonal bars, finishing in each spandrel with a sort of *fleur-de-lis*. The intervals between the diagonals are occupied by heart-shaped stems, flat and square in section; while the whole are bound together near the centre by a second and smaller circle. Most of these railings are unfortunately spoiled by aiming at an excess of lightness for which they are unfitted; and, as less infected by this malady, the Classic ones are usually better than the others. No. 132 for instance, on page 321, has a simple and graceful arrangement of lines not overdone with ornament; we wish such patterns were more frequent. Of upright railings there are few that inspire us with admiration. In panels we come back to many of the same patterns noticed under the head of railings. In capitals to columns scarcely a single instance appears in which the requirements of moulding and the capabilities of cast metal have influenced the design. Much of the foliage seems to be applied, and a good deal of it is a mere repetition of masonry detail. There are few more effective and more natural modes of treatment than that of casting the leaves in one piece with the bell and making them stand out edgewise, like thin flanges; but no example of this kind appears. We next come to some useful and convenient standards for school desks, which we thankfully remark have escaped the prevailing epidemic of ornament, and are at any rate simple and inoffensive. Some of the street lamps have a fair arrangement of lines, and only require to be stripped of their adjuncts to be passable. But even the ranges of wash-hand basins, which form a convenient and serviceable appliance, cannot be let off without a fringe or inverted cresting round their margin; and the street urinals exhibit the spoils of the

Saracen in the shape of a perfect network of Eastern surface ornament. We could wish that Messrs. Macfarlane would allow us a little more bread to their intolerable quantity of sack, and would let their useful appliances go forth to the world with nothing else to recommend them but well-studied and characteristic form.

EGANIARD: AN ALLEGORY.

A LONG time ago, as the story-books say: so long ago, in fact, that, like many of our old traditions, both the names of the personages concerned in the following events, and of the scene where they transpired, are lost to us. Not so long ago, though, but that it would be possible for us, as antiquarians, and as faithful students of the past, to surround these incidents with fictitious details, drawn from such documents of the period as have survived to us—a proceeding which, to the vulgar and uninformed, would give local colouring and apparent truth, at the expense of strict accuracy and veracity; a practice, also, which has too often, in the observance, been sanctioned by those from whom we should have expected better things. But far be it from us to detract from the merits of the plain unvarnished facts by any recourse to such unworthy tricks. It must not be forgotten, also, that there are many reasons for the silence of tradition, and a discreet obliviousness of names and places is sometimes kinder than a studied remembrance of what had better have been forgotten.

To proceed, then, to our history, which deals with a great city situated in the heart of a prosperous country, teeming with inhabitants, who at this time presented a strange contrast of enormous wealth and wide-spread poverty. It is not within our province, neither does it concern our story, to investigate the condition of the inhabitants of the vast metropolis in question. Our more immediate concern is with a product of this great city, which old and young, rich and poor, high and low, were alike engaged in elaborating. Daily and hourly, and almost, we may say, without intermission, was this industry being carried on. Whether they willed it or not, every inhabitant was forced to take part in it, and so extensive were the stores of it which they had accumulated that in course of time, as the city grew and prospered, it became a matter of the utmost importance to determine what was to become of it; for, unlike most other products, the one under consideration was *not* what could be called a marketable article; it was not one that could be bartered and exchanged, or that could apparently in any way conduce to the wealth or profit of its producers. So far was it, indeed, from being capable of being turned to account, that it had become the fashion to ignore it, and to bury it in underground caves, and conceal it in every possible way. We may here for a moment pause to explain that the townsfolk were generally not at all backward in utilising so-called waste products; everything had a use of some kind or other, and so far had this economy been studied, that they even employed the bones of their ancestors to manure their parks, and converted the ashes and rubbish from their streets into bricks and mortar.

There were many causes, however, for wishing to conceal and forget this article; one of the chief of these was that it had a very powerful method of reminding them of its presence and of making known its whereabouts, and the more they endeavoured to get rid of it the more objectionable it became.

Another peculiarity was that, slaves as they all were, in the sense of being all equally bound to engage in its production, yet, owing to some false delicacy or foolish pride, they yet among themselves concealed the fact of its existence. It was not a topic about which they cared to talk, and although it intimately concerned every one of them, the

mention of it was tabooed in polite society. This reticence does not affect in any way our story, and before we go further we may briefly point out certain facts which will render the subsequent events more clear. The city we have mentioned was divided into unequal halves by a navigable tidal river which flowed through the midst of it, and on the waters of this river the shipping of every country of the world was wont to resort for the purposes of trading and commerce. The age which immediately preceded our history was one of great invention and learning; the philosophers of that day, not content to occupy themselves with passing events, pushed their investigations to the most remote times and places. They had ascertained with tolerable accuracy the nature of the gases which constitute the sun's atmosphere, and had carried back their researches upon the origin of life to the time when the moss-grown fragment of a ruined world brought the vivifying influence to matter, which thus, by the natural process of evolution peopled ours. We have referred to these matters thus in detail in order to show how great were the attainments of scientific men at that day, and with a view also of proving the theoretical character of many of their researches, and we may add that in the natural sciences they had perhaps achieved their most splendid triumphs. It would be unfair were we to forget that engineering had progressed also with giant strides, and that within a few years the invention of the steam-engine had been the culminating-point of their ingenuity and skill.

With all their learning and ability, science had at the time we speak of failed entirely to grapple with the difficulties arising from the accumulation of the before-mentioned product, and but for the introduction of the system termed eganiard there is no knowing how great might have been the calamities which would have befallen this unhappy people. At some time previous to that which we are describing some sage had pointed out to his countrymen the value of water as a carrier. "A willing, active, and inexpensive servant," said he, "always ready to do your bidding and to remove from your dwellings this hated product." His suggestion was joyfully accepted, and in a marvellously short space of time hundreds of thousands of pounds were expended in constructing underground channels by means of which to rid themselves of this nuisance. Till the adoption of the system of eganiard—for such this plan of disposing of it came to be called—it was necessary from time to time, in the dead of night, and with every precaution to ensure secrecy and concealment, to empty and cart away the stores which they had collected. It was chiefly on such occasions that the unpleasant qualities of this product were called into play; though at all times, in dry and hot weather, it was liable to strike down the strongest among them on a bed of fever, and to decimate their children with wasting sickness.

With a splendid river in their midst, which gave them every facility for the disposal of this water and its contents, it is not to be wondered at that the plan we have described spread with amazing rapidity; and so vast were the quantities of refuse that they threw into their river that its waters became foul and polluted, and the navigation of it was threatened by the formation of enormous mud-banks and deposits. Here, then, was a new difficulty and danger, and one they had little contemplated when they were spending their thousands, nay, almost millions, on eganiard. How were they to escape from this second dilemma? After long deliberation, they decided upon forming other conduits greater than the first; and thus, by taking the matter further down the stream and emptying it out only at high water, they thought to avoid the consequences of their folly and imprudence. Here, however, they were again found to be at fault, for they had overlooked the tidal character of their river,

and forgotten that the deposits left by the ebb were carried back at each flow, and that whenever they emptied their channels the navigation was similarly impeded by the mud-banks.

To add to their discomfiture, it was discovered that this watery compound which they were throwing away was in reality of immense value, and they were daily wasting materials estimated to be worth many thousands of pounds.

Almost in despair about what steps they should take next, they appealed to the men of science to come to their aid—which was what they usually did, by the bye, at the very last moment—and their call was nobly responded to. Suggestions flowed in apace, and many were the differences of opinion as to what was to be done. Upon one point, however, they were all tolerably well agreed, namely, that the water must be separated from the matters which were suspended in it. It might be used, in fact, as a carrier as far as the river's bank, but no further. "The channels you have constructed with so much skill, and the appliances you have introduced for the mixture with water," said they, "are so far so good, but your future aim must be to do and to undo, to mix and to separate." One daring genius went so far as to propose a fresh system of channels, and called his system the "separate system," and in the main he was doubtless right. But how was the mixture which they had contrived with so much care to be sundered again so shortly, and in what way were they to regain from the water the valuable matters which they had thrown into it? Some said, "filter it;" others said, "spread it in thin layers over your fields, and it will separate itself naturally." The chemists divulged the nature of certain substances which would cause the impurities in the water to fall in the shape of precipitates, and companies were formed, who proposed by throwing in chemicals worth pounds per ton to reclaim from the water substances worth only shillings.

FIRE-BRICKS.—III.

By CHARLES TURNER, C.E.

MR. T. WALKER'S PATENT BRICK MACHINE.

IN the meantime inquiries were made of various makers of brick machinery for a machine adapted to press and mould the Beacon-hill fire-bricks when green. It was ascertained that a machine was being manufactured by Messrs. Ingram & Ilone, of the Dorset Iron Works, patented by Mr. T. Walker, manager of the West Quay Pottery, at Poole, which appeared very suitable for the purpose. It should, however, be mentioned that this machine was only designed for pressing face-bricks of clay and sand. Arrangements were made with Messrs. Ingram & Ilone, of the Dorset Iron Works, to erect this machine for the company in connection with a pug mill for pressing out and cutting off the rough blanks to be used for the press.

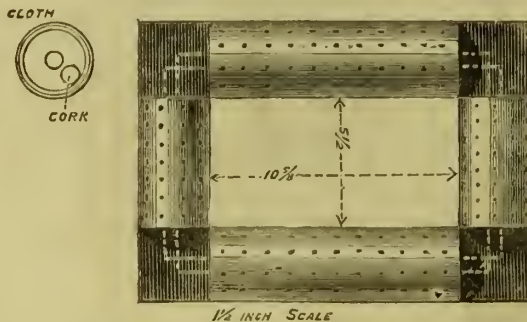
EXPERIMENTS WITH THE MACHINE.

The first difficulty that arose was from the very rough and imperfect manner in which the pug mill did its work. It was an upright pug mill, delivering horizontally, and answered extremely well when the clay was required for hand moulding. But the clay for the press had to be pugged as stiff as possible, and consequently came out through the square mouthpiece in such irregular shapes that it could not be used, as it did not fill the mould. The author of this paper determined to make use of a roller mouthpiece, on a similar principle to some already used by some of the brick machine makers, with this difference, that instead of being lubricated with water, the rollers were made hollow cast iron cylinders, pierced with numerous holes, filled with oil, and covered on the outside with coarse cloth. The oil did not unite with

the clay like the water, and the cloth made the roller sufficiently elastic to avoid tearing the hard pieces of the rough stuff out of the clay. The form of the mouthpiece was as shown in the annexed sketch.

DESCRIPTION OF MOUTHPIECE TO PUG MILL.

A A A A.—Wooden rollers covered with cloth, and filled with oil, and perforated to allow the oil to escape. B B.—Frame carrying these rollers, which is fixed to the pug mill. The press was found to act perfectly in principle, but was far too weak to resist the pressure required for the fire-bricks, and continual breakages took place. It was therefore determined, after the principle of the

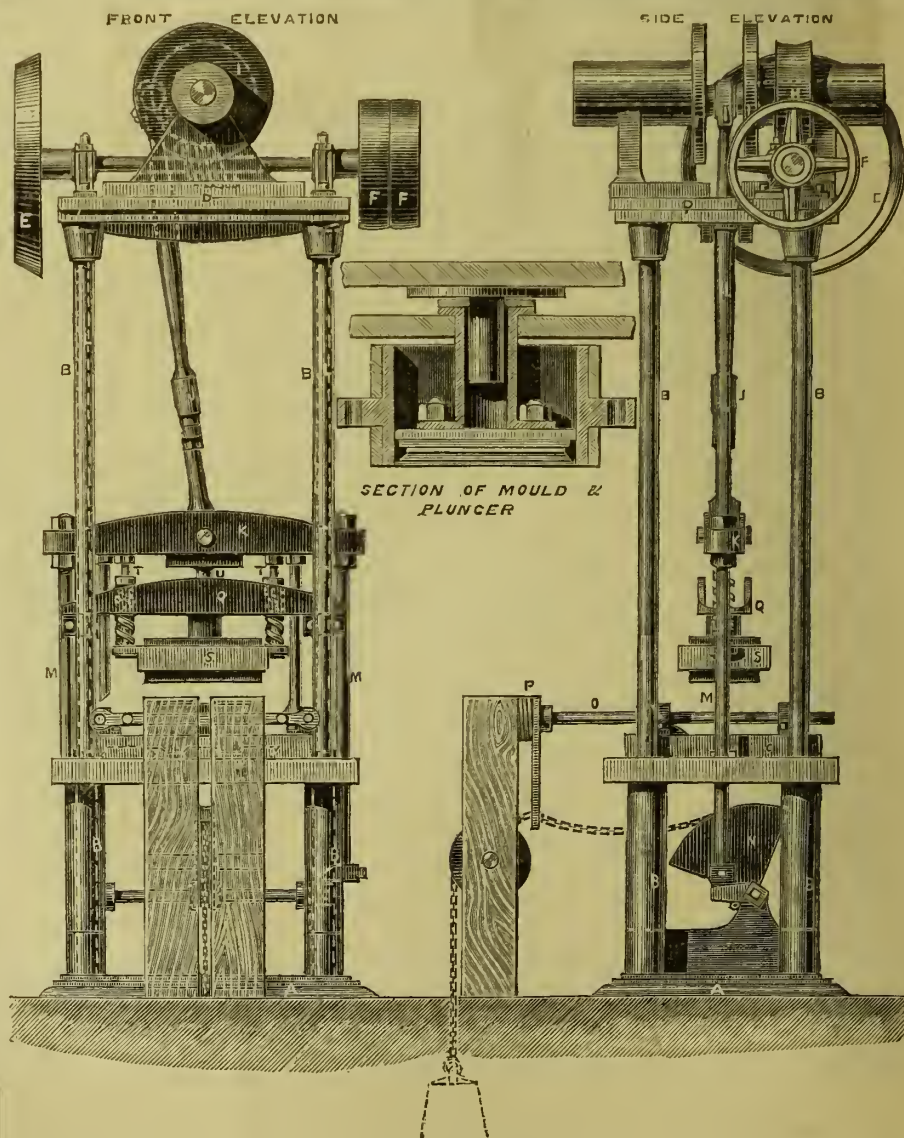


machine had been thoroughly tested, to postpone any further work until a new and stronger machine, with improvements suggested by the author, could be manufactured

driving machinery still gave way under the pressure. The driving gear was strengthened, and the machine itself was still further strengthened, one principal alteration being the substitution of a very strong disc crank for the crank hitherto used, which gave way twice, even though made of the very best Swedish iron. The result was the machine here illustrated and described.

DESCRIPTION OF BRICK PRESS

A. Bed plate, in which the standards B B are fixed. B B. Standards. C. Plate on which the bricks are pressed. D. Top plate, carrying the gear for driving the press. E. Fly wheel, F F. Fast and loose pulleys. G. Worm. H. Worm wheel. I. Disc crank. J. Connecting rod. K. Cross head, working up and down on the guide bars, L L. M M. Rods attached to the cross-head to work the quadrant. N. Quadrant having a small arm, N', projecting from the shaft on which it turns. O. Slide worked by the quadrant N to put the blank into its place, and pushes the brick off. P. Spiral spring to break the shock when the slide is brought by the weight against the post. Q. Second cross-head working up and on the guide bars, L L, and having screws at the ends to adjust the friction. S. Mould carried by the rods, S', which are attached to the cross-head, K. T. Springs round the rods, S'. U. Plunger rod,

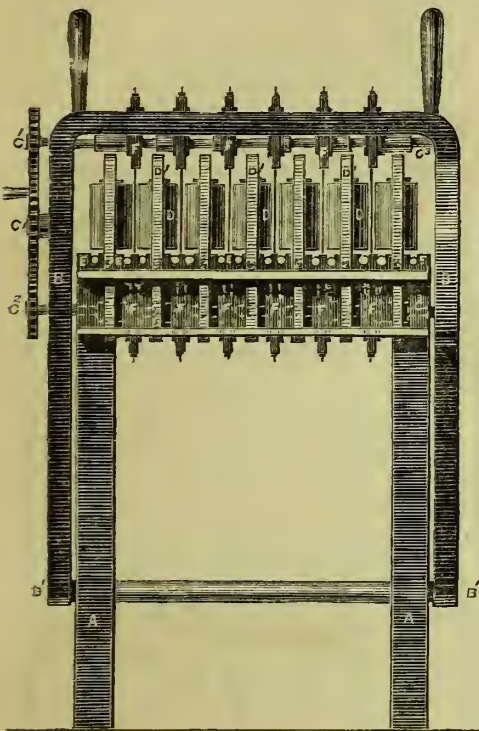


and erected. Such a machine was erected and successfully set in action, but it was found that still further strengthening was required, as some of the main parts of the

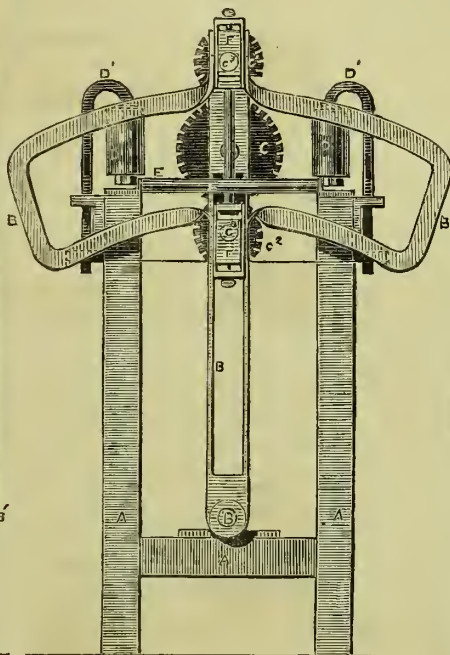
plunger being within the mould. The action of the press is as follows:—The machine being set in motion, the disc crank revolves, and the cross-head descends and

carries with it the mould until it meets with the resistance of the bottom plate, C, and can descend no further. The cross-head carrying the plunger continues its motion, compressing the springs, which carry the mould and the blank within it. On rising, the cross-head first carries with it the mould, then the plunger rod slides through the brass collar attached to the bottom cross-head and plunger until the shoulder comes in contact with the brass flange on the top of the collar; they

the blanks were cut thicker, and if the clay was rather soft they also required to be thicker. It was also found difficult to adjust the wires of the common cutting table exactly to the same gauge, especially when labourers had to set them, and a great deal of time was lost if alterations were required, as the whole gang was stopped. A new cutting table was designed by the author to obviate this difficulty, as shown and described in Fig. 3.



1 INCH SCALE



DESCRIPTION OF CUTTING-FRAME.

then ascend together and the action is repeated as before. The work was performed by six men, one man filled the pug mills, the second attended to the cutting frame and also delivered the blanks to the press-man or gauger, who oiled and dusted them, and placed them in front of the slide which carried them under the descending mould. As the mould rose another blank was placed in position by the slide which pushed the pressed brick forward until it came within reach of the taker off, who placed it on a barrow which when full was wheeled away by a fifth to the drying shed or to the hacks. The sixth supplied the mill from the soak pit. When in full work it required the six men above mentioned to work the press and pug mill—viz., one to feed the pug mill, one to cut off and deliver to man working press, two men at the press, one to put in the blanks and one to take off the pressed brick, one man to wheel away, and one man to wheel the prepared clay from the soak pits to the pug mill. These men made 3,500 fire-bricks in a day of ten hours, and could have made 5,000 if we could have kept them supplied sufficiently fast with rough stuff. Arrangements were being made to erect another set of crushers, but were put an end to by the suspension of the works. The men employed were only labourers; the foreman received 2s. 6d. per day, the rest of the men from 2s. 3d. to 1s. 6d. per day, the total amounted to 11s. 6d. per day. The engine power cost, as nearly as could be estimated, 8s. 6d. per day. The cost of pugging and moulding was therefore as nearly as possible 6s. per 1000.

CUTTING-OFF APPARATUS.

It was very important to keep the blanks from the pug mill as nearly as possible the same size and shape. If too large, clay squeezed out under the bottom of the mould, which hung on to the brick, and caused it to stick to the bed plate of the press. If too small the mould was not properly filled unless

OILING THE BED-PLATE OF THE PRESS.

In the first press used the blanks from the pug-mill were set upon small iron plates, the size of brick-boards, which were pushed forward by the sliding-frame under the box or mould of the press. It was found very difficult in practice to drive these forward exactly to their proper position, and there was a great loss of time in separating the pressed bricks from the plates, and returning them to the head of the press. It was therefore determined to let the fresh blank introduced drive forward the finished brick, oiling the

plate sufficiently to allow the blank and finished brick to slide over it. This plan was found to answer extremely well, but was expensive from the large consumption of oil, often as much as 3s. 6d. per 1000 bricks. Various self-acting oiling apparatus were tried, and one was fitted which answered extremely well, and reduced the consumption of oil to about 2s. per 1000 bricks. It was, however, found to get out of order, owing to the rough usage it was subjected to, and it was ultimately found better to use a simple oil-can, with a very small spout, through which only a limited quantity of oil could pass during the time the pressman was able to use it. The cost of the quantity of oil so used was about 2s. 9d. per 1000 bricks.

THEORY OF THE ARTS.

CONSTRUCTION.

THE larger portion of the architectural profession, mistaking their calling, become copyists and ornamental draughtsmen before they are designers. If, instead of being dabblers in water-colours, sketching, ecclesiology, and the like, cramming their sketch-books and brains with bits of Italian, French, and other Continental churches and buildings, or details more remarkable for their quaintness and frivolity of whim than any other quality, these followers of an art supposed to be creative, and in which invention and devising are the chief attributes, were to begin by an experimental study of stones, and bricks, and timber, investigating their qualities, and making tentative efforts of combination, or exercising their minds with at least the simpler ideas of form and construction, investigating the properties of geometrical solids, cones and cylinders, the intersection of planes, and the putting together of arches, trusses, and other mechanical forms of construction, we should have a race of intellectual architects, whose minds, trained practically in the school of thought and invention, would outrival in their efforts all existing art by the very strength and vigour of their conceptions. What, I ask, was the training of those giants of art who studded classic Greece and Italy with their models of form and beauty, or those who left the gigantic efforts of constructive beauty in Mediæval Europe, which so delight the weaker race of our pseudo-Mediævalists, and at whose shrines they are continually drawing inspiration? Nothing but the training above indicated. There was no learning to draw and copy before they could think; skilled artisans, masons, carpenters, and other craftsmen worked out their problems experimentally and practically; not, perhaps, with the light of science we have now, but don't avail ourselves of, but according to the lights they had then, unfettered by what had been done before. The great evil of our present architectural training is that young men begin and are taught to copy elaborate work before they can think or construct for themselves in the simplest manner. Being thus made unthinking slaves of copying, it is impossible the faculties of independent thought and invention can develop. "Sketch, measure, and draw" is the first lesson instilled into the young pupil. But what? Not simple forms or constructive problems, but old churches and abbeys, quaint bits of domestic Gothic. When such a student is launched into actual practice, the dormant faculties are brought suddenly into requisition, and the young architect is taught dearly by mishaps and blunders that which after-experience can only correct. He learns that it would have been better if he had mixed more with bricks, stones, and mortar, or had studied in the carpenter's workshop.

The evil is too apparent; the mere finish of the organic structure can only be understood after its purpose, elements, and parts have been mastered. Ornamental detail and

finish cannot be learnt unless the materials, construction, and purpose of the designer are known. This cannot be attained by mere sketching. The obvious result is the making mere details which should be the natural outcome of construction, the chief feature of design instead of the least important. Architects now-a-days proceed on the idea that their buildings must conform to such and such detail, or manner, or whim, and the problem is to bring plan and construction as near to this ideal as possible.

I have said that force, after form, is the next step in our educational course, and they may be said to be mutually dependent in practice. The idea of strength, for instance, may often determine a form or section, as in a column, girder, tie, or brace. At nearly every step in a design, the idea of force of some kind has to be considered and met, and the form to be given to the materials must be modified by it to a greater or less extent. So we see the universal empire these two principles hold, and that even purpose and convenience must frequently be subjected to their rule.

The mechanical conditions of structure demand primary consideration, and the architect should be able to modify and direct the forces he has to contend with, so as to produce stability, convenience, and other requisites without violation of essential laws either of expression or beauty. In the best periods of art, Greek, Roman, Byzantine, and Mediæval, the mechanical structure was prominent no less than the geometrical form. There are three forces to which the materials of a structure are subjected—namely, compression, cross-strain, and tension, and gravity is the active or producing force which the architect has to consider. All the three forces above named are directly or indirectly the result of gravity. The weight of his materials, timber, stone, iron, &c., have to be thought of, their relative densities and other properties. Next he has to determine the resistance or compressibility of the materials subject to gravity, as brick, stone, iron, or wood, or the foundations on which these supports rest. Another kind of force has often to be thought of—viz., lateral pressure created by arches, vaults, and roofs of various kinds, and it is the combined efforts of the two forces that often lead to ill effects in actual practice, and this lateral or cross force is frequently neglected in the designs of some of our well-known architects, whose works it would be invidious to name. There is hardly a building not subject to the three kinds of force enumerated above. In every lintel, beam, or arch, we have cross strain or weight producing the two other forces of compression and tension in distinct portions of them. It is therefore necessary to consider well where we place an arch, however small, as it frequently is an ever-active agent of mobility and destruction. The writer has seen so many disastrous instances of misplaced, misshaped, and insufficiently-tied arches, that it is a wonder to think the mistake is so often committed. The same neglect of substance of material is shown in the numberless cracked and deflected beams, lintels, and ceilings. It is too often lost sight of, also, that an insecure floor or beam does other mischief besides its own sagging. It draws the plates on which it rests, and often considerably injures the stability of the supporting walls or piers.

Mechanics, like geometry, is divided into two kinds, abstract and concrete. The first assumes all bodies to be inert, and acted on by forces external to themselves, and no general laws could be established if any natural inherent forces were admitted in the bodies themselves. Movement is also considered without reference to its mode of production. In concrete mechanics we restore to the bodies the inherent active properties they are known to possess in nature. Hence we find that abstract mechanics is the most

simple, as there is nothing assumed to modify the action of the external forces which would render any proposition more complex. Hence, too, we find but one general property of bodies taken into account in the rational duty of the science, that of gravity, whose law is simple and defined; and for all practical purposes we may take the rational or abstract laws of the science without troubling about those secondary and inherent effects which it is the province of concrete mechanics to deal with, but which are hardly sufficiently known to admit of exact rules being laid down.

The ancients, as shown by the labours of Archimedes, only understood statics, or the "conditions of equilibrium" of solids and fluids, and this precedence corresponds with the general law I have before spoken of—the simple and abstract character of the fundamental and earliest steps, as all statical problems must, from the nature of them, be much easier than those of dynamics or those in which the laws of movement are considered.

Practically we have only to look at the forces, either single or combined, which tend to move, compress, stretch or strain our materials; next to make our materials fit for such action both in quality, form, and substance. To do this a thorough acquaintance with the composition and resolution of forces is necessary, and if architects and others engaged in construction or design would devote more attention to these simple theorems of mechanics, instead of the copies from the antique and of old buildings, they would do much to take away from the profession the reproach that its members can only imitate but imperfectly the works of our ancestors. If the effect of strains and combined forces were better understood, we should not see half the designs of trusses for church roofs we now do, or the careless method of connecting the timbers, nor the equally absurd manner of substituting width for depth in timber scantlings, thick timbers where thin would be better, &c. It will be needless here to enter into the well-known laws determining either numerically or graphically the amounts and directions of the resultants and components of any known forces or force, though on another occasion the practical bearing of these valuable and neglected rules may be considered; it is enough that attention be directed to them, so that students may shape their ideas and materials, and use them with economy, and combine in their future works the results which a geometrical and mechanical disposition of their materials and a proper distribution of the parts of their designs will lead to.* In this way we may again see truthfulness, honesty of purpose, proportion, and scientific art taking the place of the pseudo-sentimental ecclesiasticism and senseless whimsicalities nicknamed art, and produced in our great works by some most popular or well-to-do practitioners of the present generation.

G. H. G.

THE NATURAL HISTORY OF PAVING STONES.†

THE first photograph that I will show you is one from a drawing in a work recently published by Professor Silvestri, a work in which he gives an account of the changes that have taken place during the last few years through the eruptions of Mount Etna. Here you have a view of the summit of Etna; the central peak is here. I need scarcely tell you that you are looking down upon it as if from one of the balloon posts, about which we have heard so much latterly. All these round knobs that stand out so numerous and so prominently are so many craters that from time to time have burst through that mountain. There are hundreds of these craters, and a large number of them constitute even decent-sized volcanic mountains, scattered round the slopes of Mount Etna. Then these large black spaces, to

* In another article I will refer to this practically.
† By Professor WILLIAMSON, F.R.S. From "Science Lectures for the People."

which I would particularly call your attention, are areas where the lava has burst through some of these craters. Of course it has filled up the crater through which it flowed; but, in addition to filling the crater, it has overflowed its summit, and spread itself out in broad table-like areas over the sides of the mountain, and over the surrounding plains. Now, we have here an illustration of the kind of thing that these volcanic mountains exhibit. You may be somewhat surprised if I tell you that those slopes of Mount Etna are scarcely more pierced by craters and encompassed by deposits of lava than Wales is, in our own immediate neighbourhood. There has been a time when Wales was almost as much disturbed by volcanic fires as Sicily is now. If you were to take a geological map of Wales, you would see that it is studded all over and in every direction with little red spots. Those little red patches are colours employed by geologists to indicate masses of ancient lava. Wales abounds in these masses. We find them on every hand, and it is to some of them, in the first place, that I shall have to call your attention to-night. I will show you a section of a part of Wales where we have volcanic rocks, and stratified or aqueous rocks, side by side, or rather, the one within the other. A section, you will understand, is that which you would have if I were to cut a Dutch cheese in two, and show you the cut side of it. If the Dutch cheese had happened to have been made of layers, piled upon one another like a pile of sandwiches, you would then have the edges of the layers revealed to view. But here, instead of sandwiches, we have a series of layers of stratified rocks; and, in the middle of them we have a great mass of volcanic lava. This is a mass of ancient lava from one of the Welsh mountains, with an unpronounceable name. I dare not venture to utter it. I should only fail, because, as you know, it is not easy to say which are consonants and which are vowels in the Welsh language, unless one is trained to it, which I was not. These are slate rocks. You will observe they are arranged in sloping layers, but these layers were originally horizontal. The reason why they slope upwards is that the volcanic fires which accompanied the outburst of this lava mass has driven up these stratified rocks, tearing them asunder, whilst the lava has forced its way through. We have several reasons for affirming that this lava was once fluid. You will observe that the lava has not only broken through these stratified rocks, but flowed upwards and downwards in all directions, filling cracks and crevices, which would not have happened had this lava not been fluid. Before I give you another section illustrating to you this action, let me show you a section of Snowdon itself cut in two. You shall also see the summit of Snowdon, which a kind friend who is in the room has brought to us. Then we have here a section of Snowdon. Here you have the extreme summit of Snowdon—the point to which many of you probably have been. You will observe that there are several series of rocks following each other. Now what, in the first place, are these purple-coloured layers at the base? (The colours are merely conventional, for the purposes of the diagram.) They are beds of slate rocks. These yellow-tinted parts above them represent enormous masses of lava. Now, this mass of lava was once continuous over many miles of district. The reason why it is now isolated is this: after spreading over many miles of district, it has been subjected to the action of currents of water when the whole was under the sea. These water currents have scooped out deep valleys, and swept away an incalculable number of square miles of solid materials. Parts of Wales that were once thousands of feet higher than they are at the present day have been completely cleared away by this watery action—by what is technically called "denudation." This accounts for the interrupted character of these masses of deposit. The summit of the mountain is a mass of volcanic product; not lava, but ashes. It would appear as if the volcanic outbreak which had covered this part of the country with this peculiar kind of volcanic rock had been followed by some outburst such as you meet with in volcanoes of the present day, in which an enormous quantity of volcanic ash has been deposited; and some of what escaped removal by denudation now constitutes the extreme peak of Snowdon. The next picture will show the peak of Snowdon as it now is. The difference between the present and the past is very considerable. I do not mean to say that the cairn is a volcanic peak; it is not; but the material upon which the wonderful cairn is erected is volcanic; it is made up entirely of volcanic ash. So that we have in Snowdon three distinct masses of material—the volcanic ash at the top; a mass of lava in the middle; and the water-derived slate rocks at the base. In the diagram I showed you just now, you saw a broad red band

crossing the picture obliquely. Now this band is another kind of volcanic rock, and of more modern date than the others. You ask, "How do we know that?" Well, I think we may safely venture to say that that which goes through another thing has come there subsequent to the time when that which it penetrates first existed. These rocks, you perceive, have been already deposited when some huge volcanic crack has been formed in them, and volcanic material has come up and filled that crack. Here we have evidence of successive outbreaks of volcanic action. Now I will show you the proof that this volcanic action was accompanied by heat. I think I have said enough to show that this material must have been fluid. The reasons why we conclude that that fluid must have been in a heated state like lava, are these: In the first place, wherever the lava has come in contact with any other kind of rock, it has entirely altered the character of that rock. If it has come in contact with coal it has burned that coal into cinders; if it has come into contact with limestone, it has burned that limestone into marble; and if it has come into contact with slates, it has altogether altered the character of those slates, and given them a different appearance. I will show you an instance proving this point. The picture that I am now going to exhibit to you is a section of another part of Wales, derived, as most of these sections are, from the very able report on the Geology of Wales, by Professor Ramsay, and which was published in the Memoirs of the Geological Survey of England.

Here we have a series of slate rocks with a dyke of lava running through them. Here is a fragment of slate torn off from these rocks and imbedded in the lava. You will observe that the appearance of the slate immediately above and below the lava is altogether altered. The difference is this—one portion of the slate cleaves easily into roofing slates; but the layer in immediate contact with the lava has been so altered by that contact that it refuses to be so cloven. Now you have here a clear proof that the contact of the lava with the stratified or aqueous rocks has made an entire change in the structure of those rocks; and we know from examination that all these changes, wherever we find them, are precisely the phenomena that would result if the same rocks were exposed to the action of heat.

The next point that I will speak of is the more special subject of the lecture to-night. I am going to tell you about paving stones. As Professor Roscoe has intimated to you, it is a somewhat unpromising subject; and I confess I was rather disposed to approach it with a little fear and trembling. In Manchester, as I learn from our friend Mr. Stott, who has charge of this department, we use different kinds of stones for paving. I have here three stones of one kind, and several stones of another kind. Before going into details, I must remind you that we have in Manchester an ancient civilisation and a modern civilisation. If you go along the back streets of Ancoats and other parts of the town, it will be desirable, especially if the day be wet, to take care to have thick shoes, because walking in thin shoes on the rounded boulder stones with which those older streets are paved is somewhat uncomfortable work. But our civilisation has made our more modern streets very different. You know that they are paved with those square stones which I think are technically called "setts," stones which make a magnificent paving. The only complaint we hear about them is when our authorities do not supply the streets with quite sufficient water, and then the gentry who ride their horses or drive their carriages are a little disposed quietly to complain. But this is only one very insignificant feature of these stones. It is true they are apt to become a little slippery in dry weather; but, on the other hand, they are exceedingly durable, and being durable they are eminently fitted for the purpose of the tax-payer, whatever they may be for the equestrian. I learn from Mr. Stott that we obtain these "setts" from three localities. Here is one stone that is obtained from Penmaenmawr. Here is another stone that has been obtained from the Clee Hills in Shropshire; and here is a third stone that is obtained from a part of Carnarvonshire, from the neighbourhood of a place they call Glynnog. What are the rocks at these three localities? The Penmaenmawr and Clee Hill stones are very similar in their essential qualities; they are lavas, closely allied to the form we commonly call basalts and greenstones. I won't enter into the minute distinctions of these stones. I am not about to bewilder you by the wonderful chemical formulæ that my friend behind me (Dr. Roscoe) could favour you with, in describing the chemical composition of these stones; that would be out of my reach and line. Neither will I trouble you much with minute distinctions between one kind of basalt and another.

There is an endless series of these distinctions that would perplex him still more to identify all the varieties when he saw them. All I have to do with them to-night is to say that there are many kinds of lava, whether we choose to call them basalts or greenstones, or felspars or porphyries, or by any other of those mineralogical names which are employed to distinguish them. But we can draw a broad distinction between basalts, an ancient kind of lava, and granites, which are also an ancient kind of lava, but a very different one. Let us see what this Penmaenmawr stone is. It is a lava very similar in its essential composition to the lavas of modern times. Let us see what sort of appearance these rocks present as seen in a photograph. I have here two photographs of Penmaenmawr, a place that probably many of you have visited. One is a view from the north side and the other a similar view from the south side. Here you have Penmaenmawr as it appears from the south side.

(To be continued.)

NON-PROFESSIONAL OPINION ON THE NEW LAW COURTS.*

IF the reports which we hear are correct, although the ground-plan and general design of our future Law Courts may be regarded as settled at last, questions of style and ornamentation are left as yet open. If so it may, even at this eleventh hour, be worth while—though we fear it is but talking to the air—to enter a feeble protest against the "ornate Gothic" with which we are threatened on all hands. Gothic, we are told, must be highly charged with ornament, or it is merely dull and barbarous. And the special examples for imitation which seem now to find favour with the changeable race of tasteful men—a few years ago they were regarded as simply grotesque—are the town-halls of the north of Europe, especially of Belgium. Now, far be it from us to enter on that very barren field of controversy, or to profess any opinion as to whether the Parthenon of Athens and the Pantheon of Rome are or are not really nobler models than the Stadthuys of a Mediæval Batavian or Belgian town. We speak, of course, as to beauty only: as to convenience, the Mediæval model and the Classical are perhaps the one as monstrously unadapted as the other for the practical purposes of Courts of Justice of the nineteenth century. But to talk of the law of convenience either to men with heads full of æsthetic enthusiasm, or to Chancellors of the Exchequer anxious only to keep down the estimates, would be hopeless. We accept—as we can do no better—the principles of beauty and economy such as our guides and masters lay them down, though conscious that neither is what we really want for public purposes. But then we must protest in favour of a third principle—that of permanency. Now if any one truth in practical art has been demonstrated over and over again, until the subject becomes tedious, it is this: that highly-ornamented architecture has under London skies no chance of durability. Mr. Street's Gothic fronts would be in ten years a mere fretwork, marred in undecipherable clots of soot. This is not probable, but certain. It is just as certain as that London chimneys will continue to smoke and Thames fogs to rise. It would be quite as sensible for a lady, because conscious that she shows to advantage in the gossamer textures of summer fashion, to lay in her provision of batistes and muslins, chalsys, and crepe-lines, in the third week of October, as for a London frontage to put on a tasteful apparel of tracery wherewith to encounter our metropolitan atmosphere. As we have said, all this lesson is familiar to us as the oft-repeated advertisements of our newspapers. It is familiarly known, also, that there are materials for building stronger in texture and smoother in surface than those which London architects affect; that there are noble styles of building of simpler and plainer cast, less inviting the adhesion of filth by their projections. But they are unemployed and disregarded. Those who control our taste dislike a simplicity which does not suit their notions of display; those who control our finances object to all extra expense in material, however economical in the long run. So we have all round us melancholy specimens of public and private buildings on which taste and money have been utterly thrown away; edifices reared within our own time at great cost, of delicate material and intricate decoration, so-called Gothic or Renaissance, all of which have passed or are rapidly passing into the condition of "grim features," soot-besmirched fronts, on which, mere habit, not sight, enables us to trace the almost obliterated lines of what was once beauty. Why do we persist in the same stolidly pertinacious course,

though shrugging our shoulders all the while at the obvious and admitted absurdities which we are perpetrating? The reasons are really not far to seek. The matter is nobody's business—or rather it is the business only of the architect and a few good-natured and frivolous people who constitute themselves his controllers. To the architect the style of high ornament is captivating; it enables him to exhibit his skill in the manipulation of stonework, his sense of what passes for beauty; it insures him admiration, or at all events the certainty of being talked about for a few years to come, while his performance remains visible. And what may follow matters little to him, except that, should he be still capable of employment, the prevalent dissatisfaction at the degraded condition to which the monument of his genius will by that time be reduced in the course of nature may engender new works and new expenses. And as for public opinion, which ought to keep architectural vagaries in order, it never looks twenty years ahead. A good many of us take a pretty lively interest in the probable success of an experiment in art which is to come off under our own eyes. No one, or next to no one, thinks or cares how London is to look in the eyes of the next generation, or to what expense our children may be put to repair our decayed surfaces or to replace them with other perishable novelties.

It is, in truth, a subject for somewhat uneasy reflection, which meets us at many different turns in political and social speculation—How far ought one generation really to concern itself in taking charge of the interests of those which are to follow after, and how does such concern habitually extend? If the answer were to be framed in accordance with ordinary usage, one might be tempted to answer, Not at all. Provident forethought for a family, we well know, is extended to many descents after the life of a disposer of property. It is the common ambition of high and low in this country to construct the limitations of such landed estate as they may die possessed of for "a life or lives in being and twenty-one years afterwards;" and they would extend that jealous watchfulness for a much longer period did the law allow it. The founder of a family looks forward for generations to come. The founder of a special institution, a college, or a hospital, will be found for the most part equally thoughtful of the distant future in the care which he may bestow on the future management of his charity. But for the interest of the general public our forethought beyond our own time and that of our nearest successors hardly seems to extend. The discussions which have taken place respecting the durability of our supply of coal in Britain appear to show how utterly futile is the task of imposing limits on present cupidity for the sake of the contingent interest of an indefinite public which is to come after us. The resources of Nature are habitually lavished without any regard to the necessities of the future; nor is this a special characteristic of our undisciplined times: it was equally the case when the body of the people were under more restraint and authority more eugenic than is thought to be the case now. The population of the county of Sussex contrived in about a hundred years to destroy so effectually the wealth of woodland which once prevailed there as to ruin the iron industry for which that county was once famous, and which, with a little economy, might have been preserved to this day. The habitual negligence of the peasantry on certain slopes of the Alps, particularly in the south of France, as to the preservation of trees, has reduced extensive tracts of Alpine valleys into mere deserts, becoming year by year less tenable from the denudation of the soil and the ravages of torrents, inasmuch that many village communities have absolutely perished by the emigration of the whole of their members, and mere savage solitudes are left behind. Over great part of Europe and Asia the forests have been made the especial victims of this spendthrift propensity; and it is difficult to exaggerate the enormous loss to industry and civilisation which this single cause has produced. In some regions (Spain, for instance) the evil seems to have been arrested simply because there was no more natural wealth left to spend. In North America the forests may still be reported as unexhausted, and in some parts as growing afresh over tracts once cultivated and now deserted; but even there the same complaint begins to make itself heard. Even in the wide wastes of Australia they have commenced the practice of "ringing" the noble Eucalyptus trees in order to save the expense and trouble of felling them; a practice which, if continued, will so intensify the tendency to drought, characteristic of the climate, as to produce fac-similes of African deserts in the Southern hemisphere. The profusion with which the wild animals have been slaughtered of late years off the face of the earth, by application of the new facilities for killing with

* Modern Architecture. From the *Pall Mall Gazette*.

which modern ingenuity has furnished us, offers another notorious example of the general truth. Immediate interests, as in such matters as those to which we have last alluded; immediate pleasures and fancy, in matters of mere enjoyment, such as the architecture which is to decorate our streets; these are the prevailing motives which govern society, and which it seems almost hopeless to counteract by mere argument, addressed either to policy or to taste. Yet something, if not enough, may be done to counteract these evil tendencies through a little quiet resolution on the part of Governments and the growth of an educated public opinion among ourselves. A department of the future, which should be charged with protecting the interests of the as yet unborn public, would be an institution worthy of the Chinese empire such as Voltaire and his fellow-philosophers imagined. Unhappily, the idea of it is little adapted to the propensities of modern Europe, and still less of America.

The *Guardian*, in an article on the New Law Courts, after sketching the history of the competition, says:—"But two circumstances interfered with its immediate prosecution. Mr. Lowe, who, it must be allowed, to his credit or the reverse, has been the lion in the way at every step, started the extraordinary proposal that the Courts should be erected not on the Strand or so-called Carey-street side, but on the Thames Embankment. There was not a single redeeming feature in this project, except that it originated with so great a man, and was supported by him for inscrutable reasons which the general public could not or would not penetrate. During the reign of this idea in Mr. Lowe's mind, he instructed Mr. Street to prepare an elevation and other drawings for a river front. Now, without any private intimation from Mr. Street, it is not difficult to see that a totally different design would be appropriate for a building which would be visible from a great distance, and would form a prominent feature, like St. Paul's or the Houses of Parliament, in every future view of the metropolis. In the Strand site, the upper portion only of the great tower and the roof of the great hall would be visible at a few yards' distance. He therefore made a much more ornate design, one calculated more to please the popular eye and to serve a purely pictorial effect. Thus, as it seems to us, he mistakenly abandoned the mass and gravity for which his buildings are remarkable, and entered on a course of reckless elaboration by which the beauty of his work was much injured. From this sprang the second cause of delay. When Mr. Lowe was at length brought back to a right mind and to the Carey-street site, so many ideas and plans had been raised and discussed that a wholly new design was asked for and obtained. But it is almost impossible that any artist, however great his genius,—and the genius of Mr. Street is undoubtedly very great,—could conceive two such noble designs for the same spot as his first for this. The second must be inferior as "Paradise Regained" is inferior to "Paradise Lost," as the "Mill on the Floss" is inferior to "Adam Bede;" as Landseer's "Morning" is inferior to "Night;" and as Mr. Lowe himself could not match his first Budget. It is too ornate, we hear from one side; it is weak, we hear from another; it wants simplicity, we are told; and finally, it is called in the *Times* "a chaos of ill-distributed masses of weak and confused outline, without form, and void of everything but freaks of detail." What this criticism is worth we cannot say; but it is followed by a vague and impractical sentence, asking for "pure and noble form, exalted dignity, and entire unity;" words, for they are nothing more, which betray an utter want of definite ideas to back them. That any conception of Mr. Street's should be weak and confused is simply impossible; and the disapproval of the present design must be put down to his departure from the severity of his first drawings, and to the over-ornamentation of the new work—a characteristic well calculated to alarm Mr. Lowe and to secure the concurrence of the public in its condemnation. For condemned, apparently, it has actually been. And if we believe the letter in the *Times* of Saturday to have been written with the knowledge of the Chancellor of the Exchequer, we may derive the further information from it that Mr. Pugin has been called in to assist in the preparation of a third design. The assistance of Mr. Pugin's father did not improve Sir Charles Barry's work at Westminster, and the unpleasant controversy to which eventually it led is fresh in our minds; nor is it easy to understand Mr. Street's acquiescence in such an arrangement. He is accustomed to draw every part of his work with his own hands, and has, we are told, left nothing to his subordinates in any of his previous designs. Unless he is the mildest of men, nay, even if he is, such an interference will be very distasteful. In conclusion, we beg to ask, first, why does not Mr. Street return

to his original design, and, secondly, has Mr. Lowe any ulterior project, like that of Lord Palmerston in delaying the building of the Foreign Office,—must we look forward to such a miserable compromise as that which disfigures St. James's Park?

DESIGN FOR COUNTRY RESIDENCE.

OUR illustration this week is a design for a country residence, which our readers will better understand from the following:—

REFERENCES TO PLAN.

A. Porch.	N. Scullery.
B. Vestibule.	O. Plate Safe.
C. Hall.	P. Dishes.
D. Dining Room.	Q. Kitchen.
E. Pantry.	R. Passage.
F. Parlour.	S. Coals.
G. Business Room.	T. Lift.
H. Principal Staircase.	V. Cloak Room.
I. Passage.	W. Store Room.
K. Conservatory.	X. Servants' Stair.
L. Butler's Pantry.	Y. Housekeeper's Room.
M. Stair up to Entresol and down to Cellars.	Z. Servants' Hall.

The vestibule under the tower has a groined stone ceiling, rising to the height of 18ft. Passing through an arched opening, we enter the hall, from which rises the principal staircase. The hall is lighted by a large coloured glass window over the lower part of the conservatory and also through the latter, from which it is separated by double transparent glass doors. The space between the doors forms also a passage from the butler's pantry to the dining-room. The conservatory consists of a dome 30ft. in diameter. The remainder of the ground plan will readily explain itself. On the first floor the dining-room is above the drawing-room, the ante-drawing-room above the pantry, and the library above the parlour. The library is finished with an open timber roof, and a balcony runs round it above the windows, in order to render the books more accessible. It is also connected with the ante-drawing-room by sliding doors, thus opening up a suite of rooms upwards of 60ft. in length. The remainder of this floor and the floor above consists of bedrooms, dressing-rooms, &c. It was designed and drawn by Mr. Thomas Lennox Watson.

THE ABBEY OF S. ALBAN.

THE most attractive portions of this structure, containing some good examples of the best periods of architecture, are the most ruinous and neglected, whilst much that is of later date, and inferior, is carefully watched and tended. The view of the ambulatory or ante-chapel to Lady Chapel is very striking and curious. The windows, which are specimens of Early English work, are richly and deeply moulded. The odd mass of buttresses, battlements, and turrets, showing here and there the bricks from ancient Verulam, contrast strikingly with the pure outlines of the tracery. The central tower possesses a charm difficult to account for, seeing that it has little pretension to architectural finish, and is of the most primitive type. It is now almost hidden by scaffolding, and it is to be hoped that the reparation will not rob it of its characteristics. The present is a good opportunity for all lovers of art or archaeology to look into the structure, as much is laid bare by the works in progress which will repay a visit.

W. H. LOCKWOOD.

JOINT FOR SHAFT COUPLING.

MR. G. V. BLACK, of Jacksonville, Illinois, has patented what he calls a universal joint for shaft couplings; and it consists in the employment for such couplings of two coiled springs connecting the two shafts either in connection with the jointed forked ends thereof, or of collars thereon or not, one of said coils being smaller and within the other, and coiled in the opposite direction to that of the outer one, and in such relation to the section of the shaft to be turned that the resistance of said shaft will tend to expand it against the outer coil, which is to be arranged to be twisted smaller by the resistance, whereby the tendency of one to be changed from its normal condition will be neutralised by the other; and all the advantages offered by the flexibility of coiled springs for universal joints will be utilised without any of the objections that prevent the practical success of the single coiled spring which, when the resistance takes place, will either coil up the spring more or uncoil it, according to which way the coil is arranged relatively to the direction in which the shaft turns, and then fly backward or forward when the resistance ceases.

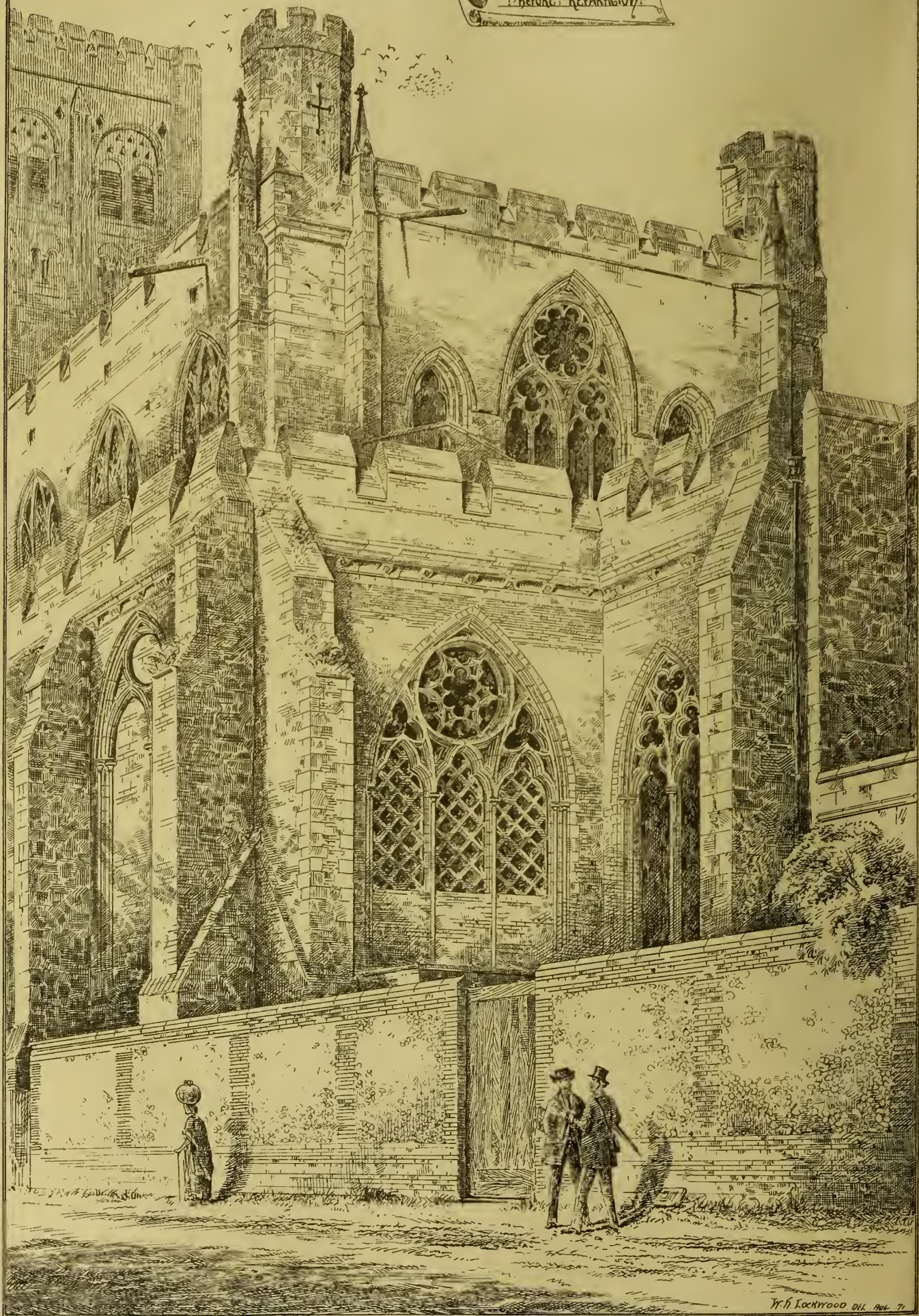
"ECCLESIASTICAL GOTHIC."

A NENT Mr. Street's designs for the new Law Courts, the *Times* says, "No one knows better than Mr. Street that ecclesiastical Gothic is wholly unfitted for secular uses." The *Saturday Review*, in an article devoted to the present controversy, rejoins that, no doubt, if there were such a thing as ecclesiastical Gothic, it would be wholly unfitted for secular uses. "The mistake lies in the vulgar notion, which the *Times* has not got rid of, that there is such a thing as a specially ecclesiastical Gothic style. We might almost think that our instructor belonged to that sect which, whenever it sees a pointed doorway or window in an ancient manor, at once calls out 'church' or 'abbey.' It is wonderful how hard it is to persuade people that in Mediæval England, just as in ancient Greece or Egypt, or any other time or place, all buildings of the same date, whether ecclesiastical, military, municipal, or domestic, were built in the same style. The ecclesiastical Gothic and the secular Gothic of any given age are exactly the same thing. It might be too much to ask a writer in the *Times* to put his knapsack on his back, and to go on a walking tour through the nooks and corners of Somersetshire and Northamptonshire, and to spy out the Mediæval manors and parsonages which will meet him at every turn, their architecture differing in nothing from the architecture of the contemporary churches. But he might go and look at a few castles, at a few of those, at least, which lie in the common beaten tracks of tourists, and see how the architectural detail in those parts of the building which allow of any architectural detail are exactly the same as he would find in a church of the same date. Nay, he might perhaps set out—though we are not sure that this might not be looked on as the strangest task of all—and look at Westminster Hall, Guildhall, and Crosby Hall, and perhaps even extend his journey to Eltham or Hampton Court. Without going any further than this he might, if he has any eyes at all, find out that English builders, in days when they were content to build as Englishmen, had no distinct ecclesiastical and secular styles, but built all buildings, whatever their use, in the one national style of their own day. Surely our teacher would not think that the princely and civic halls of which we have spoken were all of them desecrated churches, as many people thought, twenty-six years back, of the hall of the royal palace at Winchester. We must again proclaim that a church, a castle, a town-hall, a house, and a barn will all differ in their shapes, proportions, and arrangements, but that the architectural style may be, and ought to be, exactly the same in all. It is simply nonsense to talk about ecclesiastical Gothic being unfitted for secular uses, because there is no such thing as ecclesiastical Gothic at all. If Mr. Street or any other architect gives a court of law the plan, proportions, and arrangements which are suited only for a church, he is sinning against the first principle of Mediæval architecture and of all good architecture, that of building the thing that you want of the size and shape, the length, breadth, and height which best suits its purpose. A hall with the proportions of a church, and a church with the proportions of a hall, are both of them alike absurd, and they are just what the Mediæval builders never built.

FRAMING JOINTS.

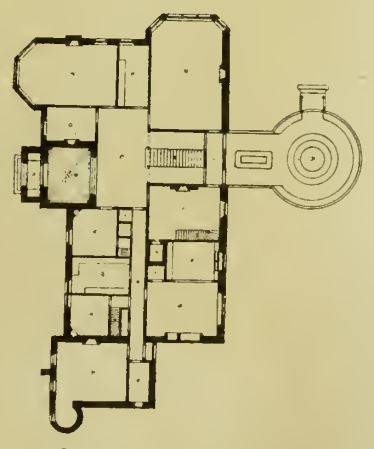
A MR. NEWTON, of New York, has patented a new and improved arrangement of mortices and tenons for framing door-sash and other like frames and cabinet-work together; and it consists in a semi-circular, or nearly semi-circular, mortice and corresponding tenon, the latter made on a greater circle, so as not to fit the curved wall of the mortice in the bottom closely, the mortice being made by a circular tool, against which the piece to be mortised is moved in a right line, or the tool moved to the piece; or the said mortice, being first made in this form by a circular tool may be modified by cutting the ends down for about a half, more or less, of the depth of the mortice, on a straight, oblique line, and fitting the tenon thereto. The invention also consists in providing the mortice on the curved wall, or the partly curved and partly oblique walls, with a tongue, and the tenons with a corresponding groove to receive the tongues. The object of the first part of the invention is to simplify and cheapen the making of the mortice, and to provide an arrangement which will prevent the sagging of the doors when the stiles shrink in width; also, to keep the joints tight at the shoulders of the tenons; and the object of the second part is to provide an arrangement whereby the adhesion of the parts, when locked together, will be greater, and a greater surface and better condition for the adhesion of the glue will be provided in the parts to be glued.

THE ABBEY OF ST. ALBAN.
SKETCH FROM THE SOUTH EAST
BEFORE REPAIRS.

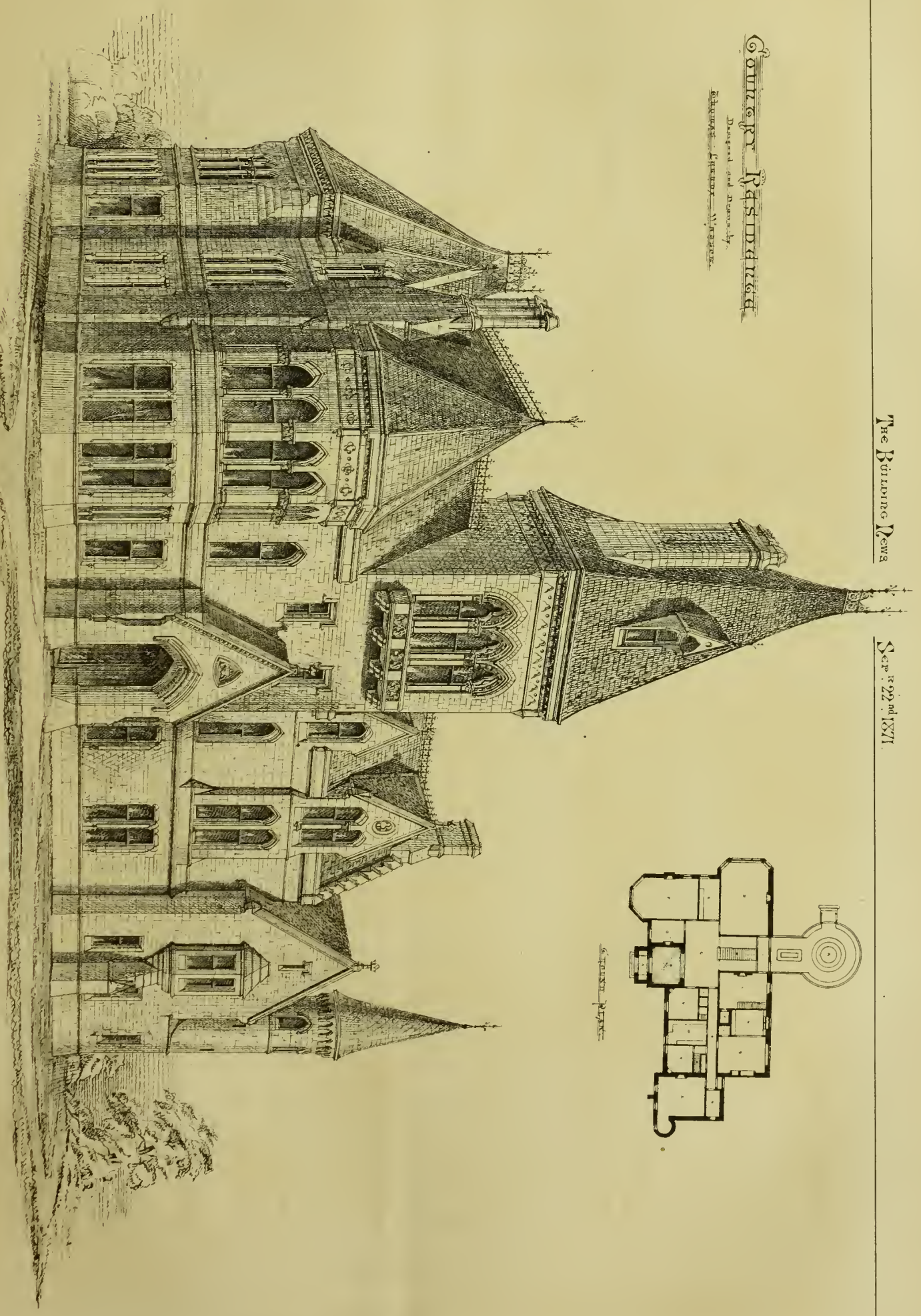


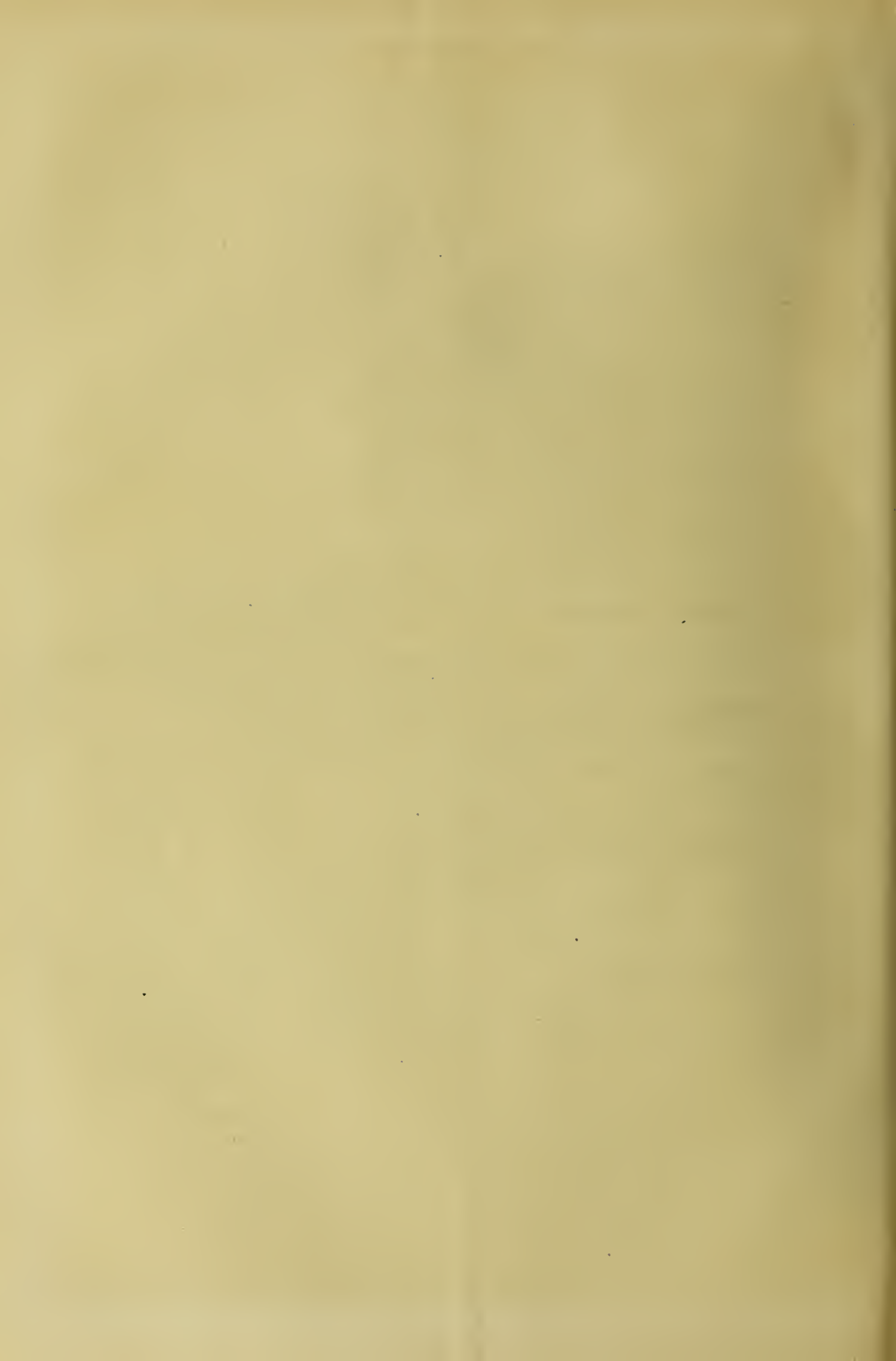
Congregational Church

Designed and erected by
Messrs. J. & W. P. Marshall



SECTIONAL PLAN





SCULPTURE AT THE INTERNATIONAL EXHIBITION.*

BY RICHARD WESTMACOTT, ESQ., R.A., F.R.S.

IN discussing art, consideration must be given to the conditions under which it is produced. Some works may be the outpourings of a real love of art for its own sake; and these, of course, claim the first rank, as the expression of the mind, the feeling, the intelligence, and the sense of beauty of their authors; others are prepared to suit the prevailing fancy or fashion, whatever that may be, of the time; or to meet a mere trade-demand, according to the value certain popular kinds of art may have in the market. The taste may be good or it may be bad; but even here there may be sufficient opportunity for offering useful remarks on their leaning to, or divergence from, a good standard; and especially for noticing the more material points of technical execution and treatment of surface; matters of no trifling importance, though they may be inferior or subordinate to the more refined question of taste in the selection of forms and the choice of subjects. Others, again, are produced simply as decorative and ornamental design, either in human and animal forms, or foliage, or even grotesque combination of these; but in which, while the object is to produce variety and picturesqueness, there is always room for the display of good taste, in the appropriate character of the ornament, and in insuring its harmony and consistency with the general design and surroundings with which it is associated.

It would be a great mistake if those who consider themselves sculptors of a superior class, simply because they do not profess or undertake the inferior practice of ornamentists, should suppose that by connecting their more ambitious studies with industrial products any degradation of high or fine art is implied, or other than a just appreciation of its prior claim to consideration intended. Far from it. It is evidence rather of the importance and value attached to the practice of the higher forms of sculpture, and their influence in giving a superior impulse to all collateral art. It might easily be shown from history and proved by existing works that the quality and character of industrial art, using this expression in its largest sense, have always been influenced by the state of art in its higher branches. In Greece, at its best period of sculpture, the taste and style of small and useful works, as vases, pateræ, architectural details, the ornamentation of arms, and of the commonest vessels, followed, both in shape and in the character of their decoration, the noble lead in the direction of the beautiful which the greater and grander works of Phidias, Praxiteles, Polycleus and others showed was the paramount motive of their practice. The same is seen in the productions of the best period of art in Italy, when such men as Benvenuto Cellini and other artists of eminence—whose superiority in this especial excellence still challenges the rivalry of modern times—dignified the callings of the goldsmith, the jeweller and dealer in precious stones, the armourer, the maker of furniture, by the beautiful accessories of their skill supplied; conferring thus a value on objects of common use which, but for the addition of this skilful labour, would have had but ordinary interest. Not a few of our own distinguished artists (as Flaxman, Theed, and Baily) have lent themselves to this useful work, and, as the history of fictile art especially testifies, effected by so doing the most satisfactory revolution in taste by the introduction of beautiful general forms, and, where opportunity allowed of it, of a graceful character of ornament, in the place of the coarseness and common-place which had previously been seen in such articles of manufacture. Surely there cannot be a more praiseworthy application of an artist's talents than this of labouring in the improvement—nay, it may be said, the creation of public taste; or a greater mistake committed than to suppose that ordinary workmen, uninstructed in the first principles of design, are competent to invent and carry out details which demand for their successful treatment the resources of a cultivated taste, supplemented by a competent knowledge of all classes of form, and the power of facile execution in expressing or illustrating the subject of the work, whatever that may be.

In reviewing the sculpture in this Exhibition, the art will be considered exclusively as one limited to form. Where the effects are sought to be produced by extra and artificial accessories, as colour of any kind, or even by variety of materials, the works so treated will come into a different category from that of pure sculpture. They then more properly fall into the class of decorative art.

It may be as well to state, in a few words, the principle on which such distinction or classification

is based. There are two propositions or conditions which should be carefully borne in mind when estimating Fine Art Sculpture. The first is, that its function is to represent by form; and, secondly, that the forms chosen should be the best that can be found in the great school of Nature—Nature, that is in her normal beauty and perfection, not as she is often and indeed, generally seen after the wear and tear of life, in what may be considered accidental deterioration or deviation from the first pure and perfect rule and type of creation.

It is reasonable to refer to this perfection as the standard by which all works in sculpture should be judged: and that the standard is a trustworthy one will be admitted from the fact that the greatest masters of sculpture, at the period of its highest excellence, made this the rule of their practice, as is seen in the numerous works that have reached modern times. In so doing, they have perpetuated the noblest class of form found in nature, and have thus left to succeeding ages the truest canon or law for the guidance of artists and lovers of art in their study of this important and fundamental principle—fundamental because without a competent knowledge of the highest class of form the sculptor must never expect to attain to eminence in his art.

The greater number of works in the Exhibition, in the various classes of sculpture proper, are contributed by artists of Great Britain. The next in number are by Italian and Belgian sculptors. It is a subject of great regret, especially considering the known ability of many of their artists, that but few specimens have reached the Exhibition from France.*

In the survey of the works submitted for public examination some discretion will have to be exercised in the reference made to particular specimens. Some, even of merit, may be omitted if they are not of a character to illustrate, in any useful or striking way, any leading truths in art. It is for this reason that portrait-statues, busts, and medallions must for the most part meet with scant notice in this survey; for however deservedly works of this class may claim attention, and even high praise when they exhibit striking character, truth to nature, and careful and refined execution, yet the very conditions which give them contemporary value or favour, namely distinct individuality, which can only be secured by copying particular and exceptional forms (often not of any remarkable beauty), and the close imitation advocated and practised by some sculptors of the details of modern dress (at this time of peculiar ugliness and unfitness for sculpture), must, as a rule, exclude them from commendation where the best examples are to be pointed out as guides to improve the public taste. It is as works of fine art that they are here considered to be not desirable examples for students; and any redeeming qualities they may and often do possess of another kind cannot elevate them to the rank of safe guides in educating the public taste in the knowledge and appreciation of one of the great general aims of art beauty.

At the same time it would not be difficult, while admitting the difference, in kind, between fine or ideal, and portrait sculpture, to quote instances of a very high class of excellence in the latter practice. But it is rare, and only found where genius of a very superior order has been able to wrestle with the drawback opposed in modern time to the exhibition here of true fine art, and so to stamp the work with exceptional value. It is the realism and minuteness which, as has been observed, are such essential ingredients in portrait, that remove it from that higher class whose province it is, or should be, to deal with the general rather than the particular, and, therefore, to choose for its exercise the most perfect forms. The over-careful rendering in sculpture of the lowest minutiae of costume, as the cravat or necktie, entirely concealing the throat and the true setting on of the head, and scrupulous attention to the size and form of buttons and button-holes and similar trifles, must inevitably vulgarise a work, and, so far, lower it in its relation to Fine Art, inasmuch as it places on an equality of representation the living man and the surroundings of the tailor and haberdasher. And yet, on the other hand, in order to avoid this, to represent an ordinary Englishman of the nineteenth century as an ancient Greek or Roman, or, half naked, with a blanket or cloak thrown over him for drapery, must be fully as objectionable from its untruthfulness and incongruity. The portrait sculptor is therefore exercising his art under difficulties for which great allowance must be made; but no recognition of these, however liberal and charitable, can make works treated in the manner referred to examples of sculpture worthy to be followed by students desiring to distinguish themselves in the nobler walks of art. For this purpose the very highest standard must be chosen.

The great sculptors of Greece, when art was at its highest perfection, were never embarrassed by these difficulties and trials, for it was at a later period than the age of Pericles and of Phidias and his scholars that portrait sculpture was introduced; and it may be remarked, as a circumstance especially worthy of note, that the innovation, dating from about the age of Alexander the Great, heralded in the decadence of the art in its highest and noblest forms, both of beauty and expression. It must not be supposed that these remarks are made with a view to disparage portrait. The importance of portrait sculpture, both in the personal interest that attaches to it, and in its historical value, cannot be overrated. It is simply intended here to point out the difficulties the sculptor labours under in modern practice, and especially in the present age, to elevate his works in this branch of art to the standard of the best known productions in sculpture. Realistic, or, as it is also called, naturalistic art, has its indisputable recommendations in the conscientious devotion it professes to the truth of nature; but even viewing art in its function of imitation only, to represent, however truthfully, what, though it may be natural, is at the same time totally devoid of beauty and, it may be, even repulsive, does not come within the proper domain of fine, or refined art; and the *minutiae* of costume, which is of all things the most varying and artificial, cannot fairly come into the category of the "natural." In the course of this review opportunities will present themselves of more forcibly illustrating the principles above hinted at.

Recurring to nations, it would not be difficult to select from the numerous specimens sent by British sculptors sufficient examples to prove their claim to hold an honourable place in the practice of their art. It has not unfrequently been observed, as a kind of reproach or reflection, by critics of English art that it is wanting in the characteristics of a school; in the sense in which, for instance, it is the custom to speak of the French, Italian, German, Flemish, and Dutch schools. The remark, however, if true at all, is only so in part; for peculiarities in national feeling will always distinctly show themselves in the art of every country, and thus give a certain stamp of individuality to its productions. It may be the demonstrative and the exaggerated, or the religious and sentimental, or the *genre* and familiar, exhibited in domestic incidents and home scenes and landscape, but marking unmistakably the idiosyncrasy or source of sentiment of each. But, even if there be truth in the general observation, the fact itself may be accounted for. Art, when it first began to be practised by Englishmen, was rather an exercise than an impulse. Up to nearly the end of the last century, sculpture in this country was exclusively in the hands of foreigners—as Roubiliac, Rysbrack, and others; and when Englishmen began to practise it it was rather to meet a trade-demand, which hitherto had been absorbed by strangers than as a fine art followed from original feeling. It was, at its best, more suggestive of the times and conventional teaching of academies, or of the practice of some popular modern leader in art, than of impulse caught either from the study or love of Nature, or from refined sentiment, or a keen sense of the beautiful. And in this may, possibly, be found a reason for its slow growth among us, and its inadequate appreciation by the general public. It was, at its opening, beyond or foreign to their sympathies. Even of Flaxman, of whom England is justly proud, it may with deference be said he based his practice chiefly on the traditions of the "antique," while the prevailing sentiment of his compositions has the flavour of the simplicity and gentle quaintness of the early earnest Italian artists of whom he was so great an admirer. It must be remembered, also, that almost every country in Europe had had for centuries its school of design, and boasted its artists of deserved reputation, while England did not possess a single sculptor whose name merits notice. Painting had its followers here somewhat earlier; but till nearly the end of the eighteenth century the sister art had no practitioners of any power; and therefore what character it had was not derived from original feeling, but, as has been observed, from such examples, often of very questionable taste, as foreign academies and schools had offered. But, admitting the force of the above argument for what it is worth, may it not be urged, on the other side, that the freedom from prescriptive trammels may have afforded to those who had not been subjected to them a wider field for independent and original thought? The discursive and varied character of subjects on which British artists have habitually exercised their talents, and the difference of treatment observable in their practice, are strongly in favour of the view here taken. It may have acted less advantageously, no doubt, in sculpture than in painting; because sculpture requires, in the

* From the Official Report.

* This Report was in print some time before the opening of the French Annex.

first place, a discipline quite distinct from painting; and also because the former arte cannot, without some loss of its essential simplicity and dignity, deal (as an art of colour and *chiar-oscuro* can) with common and ordinary subjects for imitation; in giving, for example, force and emphasis to some parts, and suppressing others either by indistinct rendering or by skilful management of light and shadow. These are means of conventional treatment utterly denied to the sculptor.

[We shall give the remainder of Professor Westmacott's report in the next number of the BUILDING NEWS.]

REPORT ON MISCELLANEOUS PAINTING IN THE INTERNATIONAL EXHIBITION.*

By SIR M. DIGBY WYATT, M.A.

THE Slade Professor of Fine Art at Cambridge, in his report on the "Miscellaneous Painting" in the Exhibition, commences by noting the fact that in the palmiest days of art—Classical, Mediæval, or Renaissance—the highest manifestations of the painter's skill were almost invariably associated with structure. The painter's aid was called in to explain and, as it were, tell the story of the scope and purpose of the building his work adorned. What was then the rule has become now-a-days the exception. The portability of modern pictures has operated to their detriment in three essential particulars: Firstly, it has tended to make them pretty rather than sublime, developing *genre* painting and discouraging historical. Secondly, it has tended to engender such a limitation of scale in design as to keep down pictures to sizes incompatible with the display of a great artist's power upon any large scale. And, thirdly, it has tended to the isolation of each conception of a painter's genius, instead of to that concatenation of ideas which best finds scope for development in a well-ordered series of subjects, all culminating in, or working towards, the illustration of some great truth or law, divine or human; or to the record of some noble drama, big with the fate of nations or of men. From this very portability of modern pictures arise the peculiar and often ludicrous inconsistencies which make our leading picture galleries so often tissues of strange incongruities. One has only to glance along the walls of the galleries of the Exhibition to meet with contrasts of style, purpose, scale, subject, and manner entirely subversive of repose, and calculated to fill the mind of the spectator with the notion that the painter's art is instituted specially to minister to whim and caprice, instead of to impress upon the imagination the noblest lessons derivable from the artist's profound study of beauty, moral no less than physical. The current predominance of easel over mural pictures, too, has a two-fold prejudicial effect upon art, inasmuch as it deprives architecture, on the one hand, of what, in the past ages of initial vigour, constituted its noblest adjunct and embellishment; and because, on the other hand, it enfeebles painting by limiting its sphere of development, and renders it comparatively purposeless. On these grounds, Sir Digby hails with great satisfaction the evidences of progress in miscellaneous painting (in forms suitable for such mural decoration as will defy the vicissitudes even of our climate) which are revealed in the galleries of the Exhibition, alike in those appropriated to the illustration of the fine arts, and in those which mark the notable progress made of late years in ceramic industry. Illustrations of other directions in which the artistic mind has been seeking outlets for the pent-up power which no doubt exists in this country for the production of historical paintings on a large scale are conspicuously absent from the Exhibition. Fresco, tempera, encaustic, and even soluble silica painting, all seem abandoned, and ceramic, glass, and mosaic painting almost alone make up the representation of miscellaneous painting—i. e., of painting other than in oil or water-colour.

As an architect, Sir Digby cannot refrain from noticing the evidences afforded by Messrs. Minton & Co., Messrs. W. B. Simpson & Sons, and Messrs. Maw, & Co., of their power to contribute novel and beautiful varieties of permanent polychromatic embellishment to the resources upon which the architect of the nineteenth century may draw for the enrichment of his structures. Great as is the progress in manufacture shown by each of these firms, their advance, and especially that of Messrs. Simpson & Sons, is distinguished by the facility with which they wield the elements of the architectonic treatment of their material, and the skill with which they have learnt to temper brilliancy in parts with masses of balancing neutral tints, both in

high lights and deep shades, so as to produce an effect of richness combined with sobriety and good taste. This is very conspicuous in several of their chimney-pieces, and in some of their dados. The staircase lining they exhibit in the Ceramic Gallery, and a pilaster with boys, fired without glazing, standing near it, are novelties well worthy the attention of architects and their patrons. Sir Digby then proceeds to give a brief historical sketch of the use of coloured faience, of which in the West, the little church at Athens, dedicated to S. Theodora, affords one of the oldest examples. In the East, originally, probably, invented by the Egyptians, and adopted by the Assyrians, it would seem to have found a teeming soil for its fructification in Persia, in which country many lovely wall coverings still remain to attest the skill with which painted faience was used by the ancient architects. In concluding his remarks upon what he considers to be much the most important form in which miscellaneous painting appears in the Exhibition, Sir Digby Wyatt says it cannot but be gratifying to us nationally to be able to recognise that, while in point of beauty of design our ceramic miscellaneous painting stands quite upon a level with that of any other people, ancient or modern, the technical excellence, the exactness, even colour and prospect of durability and impermeability of our products fairly place us at the head of contemporary manufacture; and not of contemporary manufacture only, but of every variety of such manufacture as Time, the avenger and destroyer, has left us any trace of.

Sir Digby then enters into somewhat closer detail in considering certain minor varieties of miscellaneous painting which had been specially referred to him, viz.:—

(a) Miscellaneous painting as applied to furniture.

(b) Miscellaneous painting on porcelain with a view to its applicability to furniture.

(c) Miscellaneous painting as applied to the decoration of fans.

(d) Miscellaneous painting by means of enamel or vitrified colours on a metal base.

(a)—The Egyptians, Greeks, Romans, and Byzantines all painted their furniture. Throughout the Middle Ages the practice was adhered to; but in no centuries was it more popular, or carried to greater perfection, than in the thirteenth and fourteenth, in which were produced such noteworthy specimens as the "Armoire" in the sacristy of the Cathedral of Noyon, the grand altar frontal of Westminster Abbey, and the scarcely less remarkable "retable" from Norwich Cathedral. Visitors to the International Exhibition of 1862 will scarcely need to be reminded of the attempts made by Mr. W. Burges to revive the manufacture of such painted furniture. Since that date much of that class of goods has been designed by ingenious artists, such as Mr. Talbert, Mr. Moyr Smith, and Mr. C. L. Eastlake, and however little it may have been appreciated by foreigners, in this country at least it has met with a fair measure of success. In the present exhibition there is but little of the strict Mediæval type, but there are several pretty illustrations of furniture decorated with paintings principally through the medium of coloured faience plaques inserted as pictures into the sides of chests, sideboards, &c. Conspicuous amongst such is a large wooden coffer, the principal side of which is enriched by a capital reproduction upon earthenware of the clever "May Day Procession," by Mr. Marks, A.R.A. Mr. Moody, by whom this object was designed, has, the Reporter thinks, succeeded in all respects, excepting in the baluster-shaped legs on which the chest is raised. They would be better away, and the chest lowered to the ground. The painting has been executed by female students of the Department of Science and Art. By the same hands have been painted in blue camaieu the series of elegant and spirited figures of "The Months," designed by Mr. E. J. Poynter, A.R.A., for letting into the wainscoting of the grill-room attached to the refreshment department of the South Kensington Museum. In other varieties of the application of pictures to the decoration of furniture are to be admired Messrs. Collinson & Lock's very pretty black-wood cabinet, enriched with figures and ornaments sunk in *sotto-relievo*—i. e., beneath the general surface of the planes in which they occur, as the Egyptians usually recessed their hieroglyphics and pictorial sculpture. The figures and ornaments have been then painted in red and white. The piano in light wood, stained to a satin-wood tint, and covered with ornament boldly designed and painted in monochrome in little more than outline, by Mr. Gamble, well illustrates how far the addition of a little art to any amount of utility may be made at once to lift the common-place into a source whence refined pleasure may be derived. The clever process analogous to that by which this piano

has been decorated is well illustrated by work in the production of which Messrs. Trollope and their talented artist, Mr. Brophy, have concurred.* Mr. Walker's cabinet, made in satin-wood, and painted by Mr. Clausen in quasi-imitation of the style of old English satin-wood, which used to be so prettily enriched with paintings after and by Cipriani, Bartolozzi, Angelica Kauffmann, the Mosers, Kirk, Thompson, and others, is very attractive. The most beautiful specimen, however, of pictorial furniture in the Exhibition is doubtless to be found in the Japanese cabinet, decorated with flowers, plants, and birds, all executed in the most brilliant colours by means of stained glass and straw mosaic. Not only is this object brilliant, but it is also in thorough "keeping," and it has certainly solved the truly difficult problem of how to be gay without being vulgar. In this "gay" class of painted ornament the student will find that he may gain a lesson from the beautiful patterns he will meet with upon the various articles in *papier-mâché*, decorated by the native artists of Cashmere, and contributed by Lord Mayo (No. 2341, Div. I., Class II.), and by His Highness the Maharajah (No. 2343). Amongst the satisfactory preparations for pictorial furniture decorations should be noticed some prettily-coloured tempera panels by Mr. J. H. Pollen (No. 2307), and some little religious subjects, for the most part after early Florentine masters, and on gold grounds, by Mr. R. H. Prance.

(b) There is probably no kind of old furniture which ever attains so high a price in sale-rooms as that remarkable kind, of which but little was produced—the small cabinets, "bonheurs du jour," &c.—manufactured by Reischer, and enriched by Gouthiere's chased brasswork, and painted plaques of "pâte tendre" Sèvres china. What gives exceptional value to this class of furniture is not only its rarity, but its elegance. Its great money value has naturally led to its frequent imitation, but the success has not been commensurate with the frequency of the imitation. Such delicate work requires the utmost exactness and perfection of finish, and unless the whole of the object is of equal excellence, it sinks generally to the level of the least well-executed portion. Hence the china plaque to be mounted must be no less perfect than the framing in which it is set, and *vice versa*. Of china plaques suitable for such mounting the Exhibition contains a large number. Amongst the most successful artists Sir Digby Wyatt enumerates Mr. George Gray, with his capital "Maid and the Magpie" (No. 2997); Mr. John Simpson, with his "Village Choir," &c. (2313); Mr. F. Lapf, of Bamberg, with his noble figure of "Judith with the Head of Holofernes," after Riedel (2311); Mr. W. S. Coleman, with his crowd of pretty fancies for Minton; M. Emile Lessore, with his admirable groups of children and studies from Nature and the old masters, as one and all in their respective lines to be placed upon a general level of great excellence. Sir Digby expresses his admiration for Mr. Powell's fine figure of Christ, in white drapery, painted on opaque glass. Mr. G. E. Cooke's stove tiles are elegantly designed for their purpose, as are all those contributed by Minton, Maw, and Simpson.

(c) Until a comparatively recent date the world has looked almost exclusively to Paris as the source from which anything like a really artistic fan could be obtained. As was clearly shown by the recent interesting exhibition in the galleries of the South Kensington Museum of fans of all ages and countries, this has only been the rule within the present century. Up to the close of the last century Italy, Spain, and England maintained a lively competition with France; and although the palm for absolute excellence could not in justice be withheld from her, even at that date, many English painters, carvers, and designers combined to produce very pleasing specimens of that art which it is now sought to revive. In the fan competition, the results of which are now offered to the visitor to the Exhibition, the highest merits are unquestionably exhibited by, and the highest prizes have been awarded to, three members of one family, the Misses Montalba. Miss Henrietta Montalba carries off the first prize given (£15) for her "Shooting the Popinjay" (No. 2445), and one of £10 for her "Banquet" (2446), which to Sir Digby appeared to be the cleverer of the two. Miss Hilda Montalba gains £10 for her "Water Party" (2448), and for her "Les Graces" (2447). Miss Ellen Montalba has not been as fortunate as her sisters; her fan mount "Oracles" (2449) having only won a £3 prize given by the Department of Science and Art. Her fate seems a little hard, for not only does her design recognise the peculiar radial character of the fan, but the details, heads.

* Abridged from the Official Reports, Fine Arts Division, Part I. Published by J. M. Johnson & Sons, Castle-street, Holborn.

* [This process was described in the BUILDING NEWS for June 9 last, Vol. XX., p. 445.—Ed. R. N.]

hands, expressions, and ornaments of her mount are touched with more tender feeling and delicacy than corresponding parts in fans which have been much more highly rewarded. In fact, Sir Digby considers this fan the best amongst all those exhibited. It only wants a fuller tone of colour to be eminently successful. Next to it in quality of work, though somewhat wanting in originality, are the fine fans (2433 and 2434) painted by Mdlles. Ledoux and Lemann. The second or third place has been assigned by the judges to H.R.H. the Princess Louise, whose fan mount, "A Skating Scene," has a fair title to the position assigned to it. Miss Linnie Watt gets a prize of £5 for a pretty design (No. 2469) of "Lovers Attended by Cupids." Amongst the cleverest of the unrewarded must be noticed Miss Moua Waldie Griffith's "Egypt and the Egyptians," representing with spirit and quietness, and a good sense of ornamental arrangement, the investiture of a chief fan-bearer. This good feeling for ornamental arrangement is shown by a few ladies whose want of power as artists has prevented their doing their clever designs full justice. In this class must be placed Miss Maria Eassie (2415), Miss Evelyn Leslie (2435), Miss Sarah Prince (2454), and Miss Emily Stanton (2462). Miss Julia Cowper's "Spring" (2411), on blue silk, is agreeable, and would make up into a pretty fan. Miss C. F. Frere's (2421 and 2422) show much readiness both of fancy and hand, and seem to want only a little more deliberation in perfecting clever thoughts to have attained a fair measure of excellence. Generally, it may be remarked in these designs that the particular ornamental character of the fan has been somewhat overlooked. It is not every good water-colour drawing that will make up into a good fan. Attention should be paid to such compositions, ornamental or pictorial, as it will look well when the fan is only partially opened. Attention should also be paid to the "framing-in" of the subject, so as to connect it well with the sticks; and, above all, the fan should be made gay and pleasing in colour as well as in subject. To be ornamental is its first and essential function; and stiffness, coldness, or the appearance of too great formality or labour, are so many drawbacks to its completeness as a "weapon of offence" in the hands of "armed science."

(d) Sir Digby does not make any remarks upon the general subject of enamelling, as they may well be reserved for some future year, when enamel may be a legitimate theme to dwell upon. The Exhibition, however, contains two or three specimens of enamelling of great singularity and beauty. Among these are Nos. 2337 and 2338, contributed respectively by Lord and Lady Mayo, from Jeypore. In addition to these exquisite specimens of Oriental skill in enamelling, India contributes various interesting examples of her current production. The usual blue and green enamel of the Punjab is well represented by a cup from Kangru; Hyderabad and Delhi vindicate their old fame by elegant enamelled jewellery, &c. The greatest effort of all, has, however, been made by the Maharajah of Cashmere, who has sent his own portrait, painted on gold in enamel, and surrounded by a frame, also of gold, covered with most beautiful ornamentation, flowers, &c., delicately painted on enamel after the Persian manner. It is said that Cashmere has long served as a great field for artists emigrating from Persia, and a careful comparison of Persian with Cashmerian products leads one instinctively to the impression that Cashmere must certainly owe much of her delicate perception of the beauty of colour and floral form to her proximity to and intercourse with the time-honoured land of the Sun. It is to be hoped that we may see much more of this beautiful variety of Persian enamelling in future Exhibitions.

ON REPRODUCTIONS.*

IN 1852, just after the first great Exhibition, it was felt that no aid in teaching the principles of decorative art was more valuable than a good collection of casts of plastic ornament; accordingly the Government Department of Practical Art determined to make a systematic collection of casts of objects having especial reference to art industry, and to arrange them historically.

During the following year seventy casts were taken from the furniture lent to the Science and Art Department; and, for the purpose of taking moulds from fine original works entrusted to the department, measures were organised at Gore House—the present site of the Royal Albert Hall—and arrangements were made with Messrs. Elkington to enable the public to obtain repetitions through the ordinary channels of trade. These arrangements were in-

tended to apply, not merely to casts, but to electro-deposits of various metals. In the year 1855 Government directed that an inspection and report of the Department "Du Moulage" of the Museum of the Louvre, and the Ecole des Beaux Arts, in Paris, should be made. At the same time, by desire of the Emperor of the French, M. Desachy, the "mouleur" to the Louvre, visited London, with the view of establishing an agency for the sale of casts and electrotypes. Casts of metal works from Paris, carvings in ivory, and photographs, formed part of a circulating museum—which was sent by the Science and Art Department to local schools of art. In 1856 the scheme of reproductions made no great progress, as the space at Marlborough House—where the department was located—by its very limited extent, restricted any systematic arrangement. It was not until 1858, when the collections had been removed to the South Kensington Museum, that any additions were made. The following year the important step was taken of obtaining official photographs of the Raffaele cartoons, and arrangements were reconstituted for supplying reproductions to the public. In 1861 Turner's Liber Studiorum was photographed, and the demand for positives became so large that it was determined by the department to continue only to produce negatives, leaving the question of printing to agents.

Some important reproductions were procured in 1864-65, among which were some large casts and electrotypes. The expenses in the primary operations of moulding for such works from the originals were found to be very considerable. To pursue the scheme with economy, facility, and mutual advantages to all countries, it appeared to be imperative that some basis of operation, more enlarged than heretofore, should be instituted. His Royal Highness the Prince of Wales and Her Imperial Highness the Crown Princess of Prussia, during the Paris Exhibition of 1867, took active measures to bring the subject of reproductions before the Princes of Europe assembled at that time in Paris. Unanimity of opinion upon the subject existed, and the result of it at length took the form of a convention, of which the following is the full text, with the names of the various signatories:—

CONVENTION FOR PROMOTING UNIVERSALLY REPRODUCTIONS OF WORKS OF ART FOR THE BENEFIT OF MUSEUMS OF ALL COUNTRIES.

"Throughout the world every country possesses fine Historical Monuments of Art of its own, which can easily be reproduced by casts, electrotypes, photographs, and other processes, without the slightest damage to the originals.

"(a). The knowledge of such monuments is necessary to the progress of art, and the reproductions of them would be of a high value to all Museums for public instruction.

"(b). The commencement of a system of reproducing works of art has been made by the South Kensington Museum, and illustrations of it are now exhibited in the British section of the Paris Exhibition, where may be seen specimens of French, Italian, Spanish, Portuguese, German, Swiss, Russian, Hindoo, Celtic, and English art.

"(c). The following outline of operations is suggested:—

"I. Each country to form its own commission according to its own views for obtaining such reproductions as it may desire for its own museums.

"II. The commissions of each country to correspond with one another and send information of what reproductions each causes to be made, so that every country, if disposed, may take advantage of the labours of other countries at a moderate cost.

"III. Each country to arrange for making exchanges of objects which it desires.

"IV. In order to promote the formation of the proposed commissions in each country, and facilitate the making of reproductions, the undersigned members of the reigning families, throughout Europe, meeting at the Paris Exhibition of 1867, have signified their approval of the plan, and their desire to promote the realisation of it.

"The following Princes have already signed this convention:—

"Great Britain and Ireland, Albert Edward, Prince of Wales, and Alfred, Duke of Edinburgh; Prussia, Frederick-William, Crown Prince of Prussia; Hesse, Louis, Prince of Hesse; Saxony, Albert, Prince Royal of Saxony; France, Prince Napoleon (Jerome); Belgium, Philippe, Comte de Flandre; Russia, the Czarévitch, and Nicolas, Duc de Leuchtenberg; Sweden and Norway, Oscar, Prince of Sweden and Norway; Italy, Humbert, Prince Royal of Italy, and Amadeus, Duke of Aosta; Austria, Charles-Louis, Archduke of Austria, and Rainer, Archduke of Austria; Denmark, Prince of Denmark.—Paris, 1867."

The Crystal Palace has made extensive use of reproductions in its varied courts representative of periods and styles of art—notably in the Egyptian and Alhambra Courts. In the Italian and English Courts, too, are several copies in plaster of famous sculptures, monuments, &c. The endless attractions so well known as the leading features of the Palace at Sydenham, however, quite throw into the shade the instructive value of the fine art fac-similes which abound throughout the building, and they are rarely studied or appreciated properly.

The Arundel Society has also done much towards promoting art knowledge, by publishing, from time to time, copies of works of ancient masters. These copies are chiefly chromo-lithographic and photographic. The chromo-lithographs are most successful, especially those lately produced. And, although the work is not included in the Exhibition, I would call particular attention to the copy of the triptych from the Hospital of S. John at Bruges, a very minute painting by Memlinc. This may be seen at the office of the Arundel Society. It is a faithful copy, and a remarkable work in chromo-lithography.

Having now briefly shown how the present system of reproduction originated and has developed, I propose to allude to the diversity of methods of reproduction. In the first instance I mention the broad divisions into which reproducing as a process naturally resolves itself:—

- I. The purely mechanical reproduction.
- II. The reproduction in which mechanical, principally, and some artistic, requirements are brought into operation.
- III. The reproduction depending solely on the artistic power of the reproducer.

The purely mechanical reproductions embrace:—

- a. The different methods of moulding in clay, composite, wax, plasters, gutta-percha, gelatine, and paper, and of casting from these in plaster of Paris.
- b. The methods of moulding in gutta-percha, wax, plaster and composite materials to enable a deposit of copper, silver, or gold, to be attached by the agency of electricity.

It is to "form" that these methods chiefly apply, although the art of the electrotypist extends occasionally to the imitation of discoloured metals as instanced by objects from Pompeii (No. 4035), and to the introduction of enamels and imitations of precious stones.

In the case of No. 4012, which is a metal electrotyp of a violin in boxwood, given by Queen Elizabeth to the Earl of Leicester, the imitation of the colour of the wood may be said nearly to approach that second class of reproductions in which artistic as well as mechanical skill is necessary.

Of casting methods, that by compression of the clay to the object to be cast is simplest. Mould upon mould may be built upon the face of the object, until the whole surface is completely covered. Then, to ensure a well-fitting of the moulds so made, groups composed of three or four of them are screwed together by backings of wood, and the casts made in plaster of Paris.

The results which are produced by this process have to undergo scrapings, touching up, &c., in order to get rid of the many indications of the junctions of the moulds, which repeat themselves "in reverse" on the surface of the last, as well as to correct the "faults" which occur frequently by the use of clay. To a great extent, more especially in small carvings, this after touching-up is inimical to the perfection of the *fac-simile* produced. And this applies in a lesser degree to the process of piece moulding with plaster of Paris, by which reproductions of a very perfect character are made if great care is taken in the preliminary operations. Thorough completeness of perfection is prevented alone by the indications of the seams produced by the junctures of the plaster moulds. In some cases it is considered desirable to leave the seams on the cast untouched, in order to avoid any interference with the accuracy of the piece-mould—as in the case of the cast of the Virgin and Child (No. 4005), in which the carving is in very low relief, and any touching-up would injure its character, and introduce a quality of work inferior to that of the original sculptor.

Piece-moulding, whether in clay, plaster, or any other material, involves considerable skill and time; hence its unsuitability in reproducing large objects; and this renders it necessary to have recourse to a process not only more easy and quick, but to a great extent obviating the necessity of manipulating the casts when they issue from the mould. A process of moulding with gelatine was evolved, and it meets the requirements above stated to a very considerable extent. It is applicable in the reproduction of big objects, by reason of the large area which a single mould can cover. As the gelatine is elastic, a great extent of what is technically called "under-cut" in the carving, may be embraced in one mould, thus

*From the report on Reproductions in the International Exhibition of 1871. By Lieut. H. H. Cole.

rendering unnecessary the making of a number of joints. In withdrawing the elastic mould from the object under treatment, the gelatine stretches itself in order to become released from the under-cut, but it regains its shape almost immediately, without destroying any of the extreme accuracy with which the gelatine is able to repeat every mark and grain on the surface reproduced. The two altar-pieces (Nos. 3995 and 3996) by Pierotti, illustrate the degree of relief and under-cut which is capable of reproduction by an elastic gelatine mould; the reredos of an altar (No. 3997), by Franchi, is also a good specimen of sharp and perfect reproduction by this method. In every class of piece-moulding the method of covering the carved surface with a number of inelastic moulds capable of being individually removed with ease, is theoretically the same; but the perfection of the plaster piece-moulding depends on the skill of the moulder in so disposing the moulds as to have the fewest possible joints when the piece moulds have been made to completely cover the carving. These piece-moulds are, in turn, covered, or rather backed, with larger moulds, which serve to hold them in position when the cast is being made.

In the gelatine process, the backing or wall to hold the mould is the primary work, and then hot liquid gelatine is poured between the backing and the carving. The process is briefly as follows:—The carved surface is thoroughly cleaned and covered with rolls of modelling-clay, the outer surface of the clay is smoothed, and a plaster coating or wall built against it. This wall is then removed, and the clay taken away; when replaced, an interval of the exact thickness of the clay will exist, and into this interval is poured gelatine. After twelve hours the gelatine will have attained the consistency of india-rubber, and may be peeled off the carved surface. In cases of deep undercutting, considerable force is required to effect this. The gelatine mould is then laid on the wall which supported it in the liquid state, and a plaster cast or fac-simile is made. In every distinct operation the greatest care and experience are required, in order that the natural good qualities of the gelatine may be allowed perfect freedom in producing an accurate copy.

Paper moulds are never satisfactory, the material and its application are opposed to the production of clean and sharp moulds. For objects in very low relief, paper moulding answers to some extent, and the process is easy to learn, while the material and tools are cheap to purchase. When the surface of the object has been prepared, strips of rather thin paper are placed over it; upon them are other strips pasted, and by means of a blunt-pointed wooden tool the paper is worked into the carvings of the surface being moulded. The laying on of freshly-pasted slips continues until a sufficiently strong mould is made. It is then allowed to dry and harden, and when withdrawn, plaster casts can be made from it; but, except in cases of emergency or of necessity from absence of better materials, I cannot advocate the use of the paper moulding process as one likely to produce good results.

For moulding metal-work, gutta-percha is a convenient material. It is applied when in a soft state, and the several pieces may be squeezed one into another over a surface, so that the joints of the moulds become but few.

For electrotyping, moulds are most frequently made in gutta-percha, and this material conduces to excellent results. It is, however, applicable only to the deposit of copper; for silver or gold the mould must be in copper, and is produced from a gutta-percha or plaster "relievo."

In making an electrotype from a plaster mould, the plaster is saturated with bees'-wax, and covered with a metallic powder, on to which the copper will deposit itself. For art reproductions it is most usual to make the foundation copper, which is afterwards silvered or gilt according to the original.

Before quitting the processes (which I put under the "purely mechanical" category) for making casts and electrotypes, I would draw attention to the various specific exhibits which I have classed in this way.

The bas-relief of the Diana of Fontainebleau, by Benvenuto Cellini (No. 3983), is a plaster cast, made by a piece-mould, and coloured to imitate the metal of the original. The statue of S. George, on horseback, slaying the dragon (No. 4000), is also made by means of a piece-mould in plaster; also the two panels in relief (No. 4002), from the Cathedral at Prato, by Stiattesi; and Messrs. Franchi & Son's cast of the Virgin and Child (No. 4005).

The gelatine process was employed in producing the larger and more important casts exhibited. The Norwegian Doorways (Nos. 3984 and 3990), by Mr. D. Brucciani, are casts obtained by this process, and subsequently coloured to imitate wood, of which the

doors are carved. The cast of the Eastern Gateway of the Sanchi Tope No. 3981), made under my direction in Central India, in 1869, is from a gelatine mould, and cast in coloured plaster. Messrs. Franchi have several pieces by this gelatine process, among which is the reredos of an altar formerly in the Church of San Francisco, but now in the Campo Santo, at Pisa.

Some metal castings, by Signor Castellani, are exhibited of eight original bronze objects at Pompeii (No. 4041), and were made by means of sand moulds, into which molten metal was poured.

Among the electrotypes, M. Franchi has a good fac-simile of S. Patrick's Bell (No. 4008); also copies of some pieces of plate (No. 4034), belonging to the late Countess De la Warr, of Knole Park. Electrotypes of large objects are composed of a great number of detached pieces, which are fitted together by hand, in order to form the whole copy of the original. The Hall Lantern from the Palace of the Counts Gradenigo, at Venice (No. 4040), is such a reproduction, and has been made for the King of the Belgians. The original is in wood, and it was at his Majesty's suggestion and desire that M. Franchi made the reproduction in metal. This work has involved much skill and delicacy of manipulation, and of its class stands alone in the history of reproductions. The Milanese Shield (No. 4030), is a careful electrotype, by Lionnet Frères, who have several other works in the room of the same merit, and characterised by similar good workmanship.

Since writing the above, a foreign gentleman (a Russian) has given me the opportunity of looking at an iron electrotype. This is, I believe, a new branch of electrotyping, and, judging from the specimen produced, promises to be the means of providing cheap and highly artistic metal-reproductions.

The second class of reproductions, in which the mechanical and artistic elements are mingled, embraces not a very great variety, and is confined in this Exhibition almost entirely to the copies of mosaics. In 1868, the Committee of Council on Education deputed Mr. H. Cole, C.B., and Colonel Scott to visit Italy and Sicily, with the view of reporting upon a feasible mode of obtaining for the United Kingdom an historical series of specimens of the art of mosaics. In an elaborate report upon this subject, these gentlemen recommended the reproduction of a very comprehensive chronological sequence of mosaics, which should be used for the decoration of the New South Court now nearly completed at the South Kensington Museum. Certain of these works have already been carried out, and the results, "The Saviour as the Good Shepherd" (No. 4062), executed by Messrs. Salviati, and (No. 4061), "Christ's Entry into Jerusalem," from the Cathedral of Monreale, in Sicily, executed by Messrs. Riolo, are exhibited. Without strict comparison of the copy with the original, an operation always attended with difficulty and risk, and generally impossible, the mere copying of the mosaic, left to the artistic power of the copyist, appeared to be scarcely exact enough a method for obtaining what was required. The question seemed, therefore, to arise, how the fidelity of the reproduction could be tested. A test was absolutely necessary for the satisfaction of all concerned. After a few experiments, a system was devised of which the method is simple, and the materials easily to be obtained. Sheets of damped blotting-paper of a certain thickness are applied to the mosaic to be copied; by dabbing these with a long-haired brush, the precise position of each tessera is obtained upon the blotting-paper; when dry the artist paints upon the indications of the tesserae the tints required, which he copies from the original. This portion of the work, which can be rapidly done, is, for the sake of precision, carried out in the presence of the mosaic. Reproductions of this nature have been made at the instance of the South Kensington Museum, by one of its agents. When the coloured paper copy has been approved by the authorities at the South Kensington Museum, it is passed to the mosaicist, who has but to place and fix his own tesserae in accordance with the paper mould, and to exercise his judgement in the selection of the proper colours.

It is, perhaps, unnecessary to mention that the primary reproduction cannot be considered as one of that section of works which have been described as purely mechanical. The paper "cast," if it may so termed, and its subsequent colouring, come under the second class of reproductions—viz., fac-similes requiring mechanical and artistic skill; and I think that these mosaic copies take, in that class, a high rank. Excepting the actual mosaic copies above named, there are no other similar reproductions in the present Exhibition.

Coloured photographs may be fairly classed under the second division of reproductions. Great accuracy is obtained, so far as respects drawing, &c.,

and the colouring alone is dependant upon the ability of the artist to whom the execution of it may be entrusted. If the artist has the power of precise perception of colour, such reproductions are highly valuable. To instance this, I need but refer to the very clever copy of a retable of the altar in Norwich Cathedral (No. 4066), by Messrs. Randall & Pilsbury. Objections are, at times, taken to photographs as crude and inartistic productions. In the case of the retable copy, it would be difficult to trace any of the objectionable features of a photograph. Those who know the original will be much struck with the fidelity of the copy; and this fidelity, in the main, may be said to be owing to the precision of the drawing insured by photography in the uncoloured copy upon which the artist had to work.

Of the third section of reproductions, those which depend solely upon the artistic ability of the copyist, to which the latter drawings of mosaics more properly belong, the portrait of Richard II., by Mr. J. A. Randall, may be cited as a good example. Herein one perceives the care which this precise copy has demanded. The finesse with which the pink tint is imparted to the gold background is the result of patient investigation on the part of the artist. Details such as these, in this kind of reproduction, are of eminent importance, and go far to press upon the acceptance of those who may not be acquainted with the original work the precision of the remaining and more straightforward portions which involve but careful copying. An artist who pays so keen an attention to minutiae of his operations, such as those to which allusion has been made, may reasonably be supposed to have the power of copying the drawing and colouring the original work carefully. Of course, it is only when such reproductions bear the impress of the copyist's appreciation of the character of the whole, and of the details of the original work, that they are really valuable. Memoranda, or rough sketches of fine art works are pleasant, and serve as reminders, but their value, as works of reference, cannot compare with precise and elaborately-finished copies.

To the art student the latter are of infinitely greater value than the former, which invariably contain the mannerisms of the hasty sketcher. These mannerisms are not unfrequently or unreasonably mistaken for features belonging to the original work.

Forming a portion of the historical series of mosaics, but to be classed in the third division of reproductions, are some most excellent and extremely carefully-coloured drawings of mosaics in the Cathedral of Monreale, at Palermo, which, for purposes of reference and study, are but little inferior to reproductions on a full scale. These drawings, forty-four in number, were produced between the years 1859 and 1860, by Abbate Gravina. Other drawings of mosaics are exhibited, notably one of the mosaics of S. Maria Maggiore, which is executed in a minute and accurate manner by Zeri.

In No. 4047 is exhibited a most interesting series of full-sized copies of early Christian paintings, from the catacombs of Rome, dating from the second to the seventh centuries. There are in all four, of a moderate size, and painted on canvas. A still more interesting and instructive collection of copies of early Christian paintings are exhibited under No. 4048; Nos. 7, 8, and 9 cover large canvasses. They are also full-sized copies from originals which have been recently discovered at San Clemente, at Rome, by the Prior, Padre Molloly, whose indomitable energy in carrying on the excavations has procured for him some of the most interesting, and certainly earliest, specimens of Christian mural decorations. Fortunately, the work of making the copies was personally superintended by Padre Molloly; the accuracy of them cannot, therefore, be questioned. The subject of No. 3 is remarkable for being the earliest known picture of the Crucifixion. One can scarcely over-estimate the value of preserving the recollection of such paintings, which are daily becoming more time-worn and injured by damp.

No. 4081b is a copy of the picture, by Titian, of "Peter Martyr," which was burnt at Venice some years ago; it is, therefore, now of increased value as a reproduction.

In concluding this report, I wish to draw a distinction between reproductions and counterfeits, which are calculated to do more harm than good. The *dilettanti* in art matters have, at times, greatly suffered from the latter; but hereafter it seems unlikely that victims will be numerous. Counterfeits, to pass as original works, have been, and are still, surreptitious productions, from which unscrupulous bargain-drivers have profited. But the constantly growing fashion of forming collections of fine-art works, in conjunction with reproductions of all kinds, increase a familiarity with styles of art,

as well as with fine standard art works themselves; and so, collectors of the present day becoming naturally imbued with a scepticism of objects purporting to be something which they are not, it will be difficult for the trade of quack dealers in curiosities to meet with success or prosperity. An original work of any merit rarely gets into the market without a crop of connoisseurs as to its origin immediately arising and ventilating opinions upon its virtues. It follows, therefore, that any stimulus to the creation of reproductions, which have a special and honest purpose, is regarded with apprehension by the manufacturers of "true originals" and "unique objects." Plaster-casts can rarely be made to serve as counterfeits; and electrotypes can always be detected; it is, in fact, when the reproduction depends on artistic and manipulative skill in copying that there is danger of its being turned to account as a counterfeit.

A *soi-disant* reproduction is frequently sought for rather than despised, because it is accepted as a very perfect substitute for a genuine work which is wellknown, and impossible or difficult of acquisition.

BUILDING TRADES SCHOOLS.

THE members of the building trades of Keighley are seeking to establish a building class or school at the Mechanics' Institute, something after the model of the one which has been for some time in successful operation at Bradford. In accordance with a previous arrangement, on Monday evening about a dozen gentlemen went from Keighley to Bradford, of whom four were members of the Institute and School of Art Committee, and the rest representatives of the building trade. Mr. J. H. Illingworth met them at Bradford school, and they inspected the classes. They were shown how the elementary training was made directly to prepare for the specialty of their trade education. They saw pupils first drawing on slates, then on paper; practical geometry from the black board demonstrated, and then written out in a copy book, and the figures drawn. Mr. Leadley, the teacher of the advanced classes, then explained the technical drawings in the science of carpentry, roofing, and construction. They saw the mason at work on a skew bridge; arches, circle on circle, &c.; the joiner making models of staircases, hand-rails, and irregular roofs, domes, hoppers, &c., &c. They expressed themselves highly pleased with the models executed and erected of a skew bridge, and the masonry of a circular-headed window, circular on plan, got out in arch stones—models made and worked by the pupils. After leaving the school they adjourned to supper, and there was a warm expression of the pleasure and satisfaction derived from their visit, and a determination to go back to Keighley and work to promote a similar institution for the trade there. They were thoroughly satisfied how advantageous to the trade it would be, and the present institution is admirably adapted to its purpose.

TO INDIA IN FIVE DAYS.

THE shortest route at present open between England and India is traversed in twenty days by way of Brindisi, Alexandria, and Suez, to Kurrachee or Bombay. An ambitious attempt to accomplish the journey in one fourth the time has just been made by Messrs. William Low and George Thomas, of Cardiff, in a letter to Mr. Gladstone. Messrs. Low and Thomas propose to make use of existing lines of railway and of the Mont Cenis Tunnel to Trieste, and thence to construct a railroad through Austria, European and Asiatic Turkey, Persia, and Beloochistan, to Kurrachee, and onwards to Bombay.

On leaving Trieste, the projected line would pass by Fiume to the eastern shore of the Adriatic, and run southwards along this shore to a point nearly opposite Brindisi. From here it would turn directly eastward, across Turkey, and to the north of the Archipelago and the sea of Marmora, to Constantinople. Crossing the Bosphorus, it would turn southward at Scutari, and reach the Mediterranean at Adalia. From Adalia to Alexandretta it would skirt the coast; and from Alexandretta would pursue a south-easterly course to the western extremity of the Persian Gulf. From this point it would follow the shore of the Gulf, and of the Arabian sea, to Kurrachee, the total distance from London to Kurrachee being 5,311 miles by rail, and 28 miles (the Straits of Dover) by sea. At a uniform rate of 10½ miles an hour by water and 40 miles an hour by land the journey would be accomplished in 5 days, 16 hours, 45 minutes. Calculating the railway travelling at 30 miles an hour, the

time would be 7 days, 13 hours, 22 minutes; and at 50 miles an hour, 4 days, 10 hours, and 13 minutes. Of the total length of line required nearly one-fourth (1,170 miles) is already constructed.

The highest estimated cost of the undertaking is in round numbers 41 millions sterling, and the estimated cost per mile ranges from £8,000 to £17,000 in different localities. The gross estimate for the several sections is as follows:—

In Austria	£6,545,000
In Turkey in Europe ...	7,224,000
Steam-ferry across Bosphorus	100,000
In Turkey in Asia	14,670,000
In Persia	6,840,000
In Beloochistan	5,392,000
In Scinde	184,000
	£40,955,000

The authors suggest that the cost of construction should be borne not by one nation only, but by all through which the line would pass, and they assume that to bring India within five days' journey of England would be a source of enormous through traffic, as well as of traffic between various intermediate points. Their suggestion is that there should be an Anglo-Indian Company, responsible for the construction and maintenance of the through permanent way, and a group of subordinate companies responsible for the construction and maintenance of all stations, sidings, and other works required for the local traffic to, from, or within, each country that would be traversed. Under such an arrangement the through train from Calais to Kurrachee would take precedence of trains running shorter distances, these being shunted to make way for it; but, with this reservation, each local company might run its own trains between the termini and any point in its own territory. Thus the Turkish company would be at liberty to run between Calais and Constantinople or between Constantinople and Kurrachee.

The English through train, after leaving Calais, would not, according to the scheme projected, stop before arriving at Paris, and then only for a few minutes, for the purpose of attaching and detaching carriages and changing locomotives. The next stopping-place would be Turin, after that Trieste, then Salonika, after that Constantinople, and then near Antioch, then Bagdad, Bushire, some town in Beloochistan, and lastly Kurrachee. In addition to these other stations would be fixed upon, for the purpose of changing the locomotive. Another daily through train would start from Paris, stopping at the same stations as the through train from London. Another daily through train would start from Turin, stopping at the same fixed stations; another from Trieste, another from Constantinople, also Antioch, Bagdad, and Bushire, each starting daily for Kurrachee. Thus we should have an English, French, Italian, Austrian, Turkish, and Persian through train, leaving for India every day, and trains leaving India for each of these places respectively, with other trains between each of them and other important stations on the route.

The projectors conceive that the great difficulty that has to be overcome is the formation of companies and the raising the necessary capital for constructing the lines of railway in the different countries through which it is proposed to pass, and they think this could be surmounted if the Governments of these countries were to take an active part in the matter. On the supposition that a year would be required for preliminary inquiries and for the granting of concessions, the authors assert that the whole undertaking might be completed and at work within three years from the present time.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

HAWICK ARCHÆOLOGICAL SOCIETY.—At the monthly meeting of this society, held on Tuesday week, Dr. Brydon in the chair, a paper by Mr. Robt. Govenlock, Teindsie, on "The Exploration of a Sepulchral Cairn at Ladyside, Mid-Lothian," was read. The cairn was interesting in so far as, although piled up after the most approved fashion of ancient cairns, it yet contained nothing except a small vessel of earthenware, elaborately ornamented, and a few fragments of burned human bones, buried at a depth of two feet below the natural surface.

BIRMINGHAM ARCHITECTURAL SOCIETY.—The annual excursion of the members of this society took place on Wednesday week, when a party proceeded to visit Albrighton, Tong, Weston, Lilleshall, Sheriff Hales, and Shiffnal. At Albrighton Church, the early Norman work in the tower, and the tomb of Sir John Talbot in the chancel, were carefully

examined and fully discussed. A pleasant drive brought the party to Tong Church, where they were met by the Rev. Mr. Laurence, who conducted the visitors through the church, which is the one which Dickens described, and Cattermole drew, in connection with the story of "Little Nell." Mr. Laurence directed attention to the traces of the cannon balls of the great civil war, the splendid carving of the old screen and *miserere* seats, the traces of the rich old colours still remaining on the stone and wood, the magnificent monuments of the Vernon family, the Golden Chapel, with its rich pendants and fan-vaulting, and venerable remains of gold and green and blue on its quaintly-carved roof, the rich old altar-cloth, worked by pious fingers and pillaged by less pious hands of latter days, the curious old "presses" full of portly folios and squat quartos and damp duodecimos, which had so long formed the neglected "Minister's Library" of Tong—all were most completely and courteously shown; and Mr. Laurence received the very hearty thanks of all. After luncheon the party proceeded to the old, long, straight line of the Watling-street—to Weston Hall, the seat of the Earl of Bradford, which had been thrown open to the visitors for the day. Returning along the line of the Watling-street, the party proceeded to Lilleshall Abbey. The noble western doorway, with its capitals and mouldings almost perfect, though the handsome shafts were gone; the ruins of the tower or towers, so thickly clad with ivy that the stairs could not be found; the rich but simple effect of the Norman capitals and corbel-heads; the grand proportions of the nave, the absence of any aisles, the traces of plaster over the old rubble of the walls, the doubts as to the groining and the lighting from the chancel windows; the Late Decorated, or perhaps Flamboyant, window in the east; the traces of the sacristies, and treasury, and kitchen, and guest-house; the refectory, now a garden within the venerable walls of the old hall; the rich, quaint, carving on the early Norman doorway on the north, leading from the offices to the nave, the details of the construction and ornamentation concealed by so much splendid ivy, formed subjects for discussion. The visitors left to proceed to Sheriff Hales Church and Shiffnal, where dinner was provided at the Star Hotel—the President (Mr. Y. Thomason) in the chair. After dinner the party proceeded to the church, which was specially lighted up for their inspection, and after a full examination of the restoration by Mr. Gilbert Scott, returned to the station.

METROPOLITAN IMPROVEMENTS.

PROPOSED NEW THOROUGHFARE FOR EAST LONDON.—Efforts are being made in East London to extend the Bethnal-green-road and the Roman-road to Stratford and Leyton, which would greatly facilitate the means of communication by road between the East-end and the northern and north-western districts of the metropolis, besides opening up highly-eligible building sites.

NEW CITY THOROUGHFARES.—The "shambles" at the west-end of Barbican have been removed, and it is in contemplation to make a new street from the corner of Aldersgate-street, opposite Long-lane, Smithfield, to Fore-street and London Wall, thus enabling the heavy traffic from Smithfield towards London Wall to avoid the *detour* of Red Cross-street or Jewin-street. This is a very desirable improvement; but when is that fine new thoroughfare leading from Holborn Circus to Smithfield Market to be completed by being carried a few hundred yards further to Old-street? Till it is, its value as a London artery is materially impaired.

THE WIDENING OF CITY STREETS.—At the meeting of the City Commissioners of Sewers on Tuesday last, the Finance and Improvement Committee reported that through a difficulty in arranging terms with the different owners of the premises, 192, 193, and 194, Upper Thames-street, they were unable to effect a continuation of the widening of the street. The Committee also reported that they had arranged for the widening of Mark-lane in front of the new Corn Exchange, at a cost of £400. The report was approved.

FRAGMENT OF THE BLACKFRIARS MONASTERY.—The Rev. E. Venables has called attention to a fragment of the Blackfriars Monastery that has come to light in the formation of Queen Victoria-street, leading from Blackfriars-bridge to the Mansion House. A piece of Mediæval walling and the fragment of a buttress are to be seen among the *debris* of a demolished house on the left-hand side of the street, going up from Bridge-street, just before the Bible Society's House is reached.

Building Intelligence.

CHURCHES AND CHAPELS.

BIGNY.—The parish church of S. Mary, Bigny, Lincolnshire, is about to undergo some alterations. A new east window, and various repairs to the chancel, are in contemplation. Mr. Huddleston, of Lincoln, is the builder, and plans have been prepared by Mr. Wm. Scott Champion, of London.

BRISTOL CATHEDRAL.—In last week's *BUILDING NEWS* it was erroneously stated that "the funds required to finish the nave and towers as far as the roof of the building are about £1,000 or £1,200." We should have stated the amount required to be from £10,000 to £12,000.

CHEDDAR.—It has been determined to undertake the restoration of the parish church of Cheddar, Somersetshire. The work will be assigned to Mr. Butterfield, architect, and the estimated expense is about £3,000.

FOLKESTONE.—The complete reseating of the old parish church with appropriate low open sittings, in place of the present high, ill-arranged, and inconvenient seats, is now in contemplation, together with an improved arrangement of the lighting, and the committee has decided to request Mr. S. Slingsby Stallwood, architect, of Folkestone, to prepare the necessary plans.

GREAT TOTHAM.—A new Congregational Chapel has been erected at Great Totham, Essex. The building is designed to accommodate 320 persons—viz., 230 on the ground floor and 90 in a gallery at the end. The walls are of red brick of the neighbourhood, relieved with white arches, bands, and patterns. Stained deal benches are provided throughout the building. The cost has been £650. Mr. King, jun., of Halstead, was the contractor, and has carried out the works under the direction of Mr. Charles Pertwee, architect, of Chelmsford.

HALIFAX.—On Saturday the corner-stone of a new general Baptist chapel was laid at the Ovenden township, near Halifax. The chapel will be in the Gothic style of architecture, with neat pitch-faced gabled front and two slightly-projecting porticoes, a large central rose window over, and a smaller one on each side. The size of the building will be 77 ft. by 45 ft., and the estimated cost, including the land and furnishing, £1,500. The architect is Mr. T. Horsfield.

HARROGATE.—Yesterday (Thursday) week the chancel and temporary nave of the new church for the newly-formed parish of S. Peter's, Harrogate, was opened for divine worship. The church has been erected from plans by Mr. J. H. Hirst, architect, of Bristol, the builder being Mr. Ridal, of Wadley, near Sheffield. The style is Early Decorated, and the building will hold, when completed, 1,100 persons. The chancel, temporary nave, &c., now available for public worship will comfortably seat 450 persons. The interior walls of the chancel and apse are of white Bath stone ashlar, from the Corsham Down quarries. There is a profusion of carving and sculpture about the building, all of which has been executed by Mr. Harry Hems, of Exeter. The sum of £5,000 has already been expended on the work.

HORDWELL.—The parish church of Hordwell is being enlarged. Mr. Giles, of Furnival's Inn, is the architect. A new chancel is being built, and the church is being lengthened six feet. The cost for the work now in hand will be about £2,000, but it is proposed eventually to put a new roof to the nave in accordance with the chancel roof. Mr. Lander, of Burton, is the builder.

HORSHAM.—S. Mark's Church, Horsham, is being enlarged. The building is of local sandstone, with Bath stone dressings. The principal additions are a tower and spire, which, when completed, will be 135 ft. high, and a new south aisle. The cost will be about £4,000. The architects are Messrs. E. Habershon & Brock, of London. Mr. W. Shearburn, of Dorking, is the builder.

INVERNESS.—Three ornamental sedilia have been presented by J. T. Mackenzie, of Kintail, for Inverness Cathedral, at a cost of £100; and Colonel and Mrs. Learmonth have presented a reproduction, with some slight changes, in white marble, of the font at the Church of our Lady in Copenhagen, the work of the Danish sculptor Thorwaldsen. It consists of an angel kneeling, and resting her knee on the font, which is formed of a sculptured shell. The cost is £340.

KNOWLE.—The opening of the new chancel of the Church of the Holy Nativity, Knowle, took place on the 14th inst., when there was high celebration at

eight o'clock. The chancel is a very attractive looking piece of work, the style reminding a spectator of an Eastern temple. It is of the Byzantine school of architecture, and is the only one of the kind in Bristol. The apse is semicircular, with a domed roof 30 feet in diameter, of cement concrete. At present this dome is coloured blue, but eventually it will be painted, the subject being the Ascension. The altar is a fine production of inlaid wood, and over it is a beautiful canopy of alabaster and marble, surmounted with exquisitely carved figures, the whole supported by pillars of marble and alabaster, the capitals of which will be richly carved. The panels round the chancel are to be filled in with paintings, and the stations of the cross will be carved in bas-reliefs around the church. The floors are laid with encaustic tiles. The cost has been about £2,600.

LINCOLN CATHEDRAL.—The restoration of the north arm of Lincoln Cathedral is approaching completion. The Purbeck columns have been renewed where they were decayed, and the ceiling has been renovated and the original decoration reproduced. The restoration of the chapels in the transept has also been commenced.

LONDON.—The church of S. Mildred, Poultry, which it is proposed to pull down, was erected on the site of a more ancient edifice, which was destroyed by the great fire in 1666. On this occasion (says "A Resident," writing to the *City Press*) the parish to which it belongs was united with that of S. Mary, Colechurch. The two parishes were served from that time by the existing structure. Now they will be united with S. Olave's, Old Jewry. The church of S. Mildred is the work of Wren, and by no means one of his good designs. Its interior is a simple room, with a flat covered ceiling, "remarkable for nothing but a strange want of symmetry at the west-end. On the south side of the organ, which stands in a gallery, a column is introduced, in order to carry the belfry, which occurs at that corner of the building; but, inasmuch as there was no similar weight to support at the other side, a corresponding column was not deemed necessary." The interior is very small, being 56 ft. long by 42 ft. wide, and 36 ft. high. Externally the tower—a very plain but not ungraceful portion—is 75 ft. high. The cost of the work was £4,654 9s. 7½d. Of the old church of S. Mildred-in-Cheap, which this building replaced (and which is not to be confounded with that placed under the same invocation, and standing in Bread-street, likewise rebuilt by Wren), Stow says that it was erected in 1457; but there must have existed a still earlier church in this place, and with this name, for John de Aswell was rector in 1325; and it is recorded that the church in which he served had become decayed, so that the one destroyed by the fire was built in its place. Peter of Colechurch, who (1176) in part built Old London Bridge, is stated to have been chaplain of S. Mildred's, Poultry, but more probably of S. Mary's, Colechurch, which was united to it long after his time, *obit*. 1205. He was buried in the Lower Chapel of S. Thomas, of his own designing, on Old London Bridge. In the Church of S. Mildred, destroyed by the fire, was interred (1580) Thomas Tusser, of the "Five Hundredth Pointes of Good Husbandrie." His epitaph is preserved in Stow's "Survey," with the names of other City worthies who were commemorated by their tombs in his day, including John Garland. From the produce of the sale of the materials of S. Mildred's Church, and of its site, £9,000 is to be expended for the erection of a new church in Clerkenwell; £2,000 for a rectory house to S. Olave's, Old Jewry; £4,000 for reseating and keeping in repair the church of the parish, with benefactions to those of S. Andrew-by-the-Wardrobes, and S. Ann, Blackfriars.

MIRFIELD.—On Wednesday week the corner-stone of a new chapel for the Baptists of Mirfield was laid. The new structure, which is to be erected from designs by Mr. Cocking, architect, of Huddersfield, will accommodate 630 persons. The style of architecture is Romanesque, and the cost will be about £3,000.

SOUTHILL.—The parish church of Southill, one of the oldest in Cornwall, was reopened on Monday week after restoration. The edifice, which dates from the fourteenth century, was originally cruciform, but it has been denuded of one transept, whilst an additional aisle has been added. The tower, which is in a good state of preservation, has not been touched by the restorers, but the other parts of the church have more or less undergone extensive alteration. An arcade has been taken down, as has also the south wall, while the old roof has been entirely removed. Three new windows have been put in, two on the north side and a new Polyphant stone window in the east of the south aisle. There are a piscina, a sedilia, and

a "squin," and two sepulchres in the chancel. The nave and south aisle are paved with tessellated tiling, and the chancel with encaustic, glazed, and other tiling, thus presenting a beautiful appearance. The seats, which are open, will hold about 400 persons. Polyphant stone is conspicuous in the present building, the dressings being of that material, and the gables being all newly coped with it. The cost of the alterations will amount to £1,200. The builders have been Messrs. Bone & Son, of Liskeard. Mr. J. D. Sedding, of Bristol, prepared the designs.

WALKLEY.—A new Wesleyan Chapel, from the designs of Mr. J. D. Webster, is being erected at Walkley. The joiners' work will be by Mr. J. Robertson. The building will be Gothic, with a rock-faced front, the stone being obtained from Crookes. It will also be used for day and Sunday schools. The cost will be about £600. Mr. Butler is the builder.

BUILDINGS.

BRATTEN ST. MAUR, SOMERSET.—A mansion is now in course of erection here for Charles Penruddocke, Esq., of Compton Park, Wilts. The architect is Mr. James Soppitt, of Shaftesbury, and the builders Messrs. W. Clarke & Son, of Burton. The walls are built of Forest marble, quarried on the spot, with Douling stone dressings; the roofs are covered with Whitland Abbey green slate, and the interior joinery throughout is of pitch pine, varnished.

CAMBRIDGE.—Extensive alterations and improvements have been made in the colleges of Cambridge during the past few years, and still the movement does not appear to flag. The building of a new master's lodge and block of students' rooms at Pembroke College is rapidly progressing. The contract, which is being executed by Mr. Horsman, Wolverhampton, is stated to be over £25,000. Both buildings are of the Tudor style of architecture, and will effect a great improvement in the college and its locality. The new lodge will be at once elaborate and extensive, and the new building in Trumpington-street will provide seventeen additional sets of students' rooms, besides lecture-rooms and fellows' apartments. The building, which is constructed on the fireproof principle, is built from designs by Mr. Waterhouse. At King's College operations have been commenced for erecting twelve additional sets of rooms next Trumpington-street. This contract will exceed £7,000. Other alterations are contemplated at Trinity Hall and Christ's College. The front of the Fitzwilliam Museum is just now in a chaotic state, the workmen of Messrs. Cubitt & Co., Gray's-inn-road, being busily engaged in completing the spacious entrance-hall according to the main features of Mr. Bassevi's original design, which Mr. Barry, architect, estimates will cost £2,000.

CHATHAM.—The erection will shortly be commenced of the new Royal Engineer Institution and halls of study for the School of Military Engineering. The buildings will be on an extensive scale, the cost being estimated at £21,000. They will be erected near the Engineer Barracks on ground now occupied by the Huts Barracks, excavations made there having shown that good foundations can be obtained.

ELSHAM HALL, BRIGG.—A new entrance-porch and conservatory had been erected at Elsham Hall, Brigg, Lincolnshire, the seat of Colonel Astley. The whole is of brickwork, with stone dressings, the windows of the conservatory having circular heads, turned in brick, with ornamental frames. The front elevation consists of projecting piers between each light, with caps and bases of stone, surmounted by a cornice with patterns in sunk brickwork. The porch follows the line of cornice in height, projecting out from the main building 6 ft. 6 in., the entrance into porch being through a wide double door of sunk and raised panelling, the upper portion being filled with glass. An entrance is formed from conservatory into the drawing-room by an archway, which is closed or opened at pleasure by a sliding door of Honduras mahogany. Another door at the extreme end of conservatory leads into the gardens; so that visitors approach the entrance-hall surrounded on all sides by flowers. The floor on either side of the flower-stands is paved with plain and encaustic tiles, arranged in suitable patterns. Mr. Huddleston, of Lincoln, is the builder, and Mr. William Scott Champion, of Guildford-street, Russell-square, and Henley-on-Thames, is the architect.

HANDSWORTH.—On Friday last, a meeting was held at Handsworth, to take into consideration the desirability of the erection of a public hall on the site of the late toll-gate, Villa-road. A design has been prepared by Mr. W. H. Ward, of Paradise-street, Birmingham. The style is a modern adaptation of Gothic, the materials proposed being red brick, with stone facings. The principal feature of the front elevation is a clock tower, with entrance

porch in the base. The large hall will be 60ft. by 35ft., and with the gallery is intended to accommodate 600 persons. The roof will be open, and of stained and varnished timbers.

LANARK.—The foundation-stone has been laid of a public hospital for the Lanark district. The building is constructed for thirty-two beds, with all the modern appliances. The ground plan is of the form of the letter H. The front is 136ft. in length, and the centre and side blocks run back 72ft. Except in the administrative department, the building is all one story in height. The designs were drawn out by Mr. James Watson, architect, Dundee.

MILE END.—The New Pavilion Theatre, Mile End, was reopened on Monday last, after great alterations and improvements, under the direction of Mr. J. T. Robinson, architect, of Haverstock-hill. The decorations have been executed by Messrs. Pashley, Newton, Young, & Co., and the large new sunlight has been fitted up by Messrs. Hulett & Co., of High Holborn. The theatre will now seat more than 4,000 persons.

PETERSHAM.—A gymnasium for the accommodation of seventy boys is being erected at Bute House, Petersham, Surrey. The style is Gothic, from the designs of Mr. W. Scott Chapman, the architect of the existing schools and out-buildings. M. Castelletti, of 21, Maiden-lane, provides the gymnastic apparatus. The builders are Messrs. Sweet, of Richmond, Surrey.

ROCHDALE.—On Monday the Bishop of Manchester laid the foundation-stone of S. Peter's National Schools, on a site adjoining the new church in Newbold, Rochdale. The building has been designed to accommodate 500 boys, girls, and infants, and the entire cost has been estimated at £2,000. The first contract has been let to Messrs. Ellis & Hinchliffe, who are proceeding with the work under the direction of the architects, Messrs. Medland & Henry Taylor, of Manchester.

ROMSEY.—The foundation-stone of new schools has been laid at Romsey. The school is designed by Mr. W. E. Nesfield, architect, of Argyle-street, London, and the builder is Mr. George Wheeler. The building will be of red brick, with Bath stone gables. There will be a porch at the south-west angle, over which is to be a stone bell-cot. Space at this end has been reserved for future enlargement. At the opposite end will be the master's residence, a two-storied house, with garden around. Internally the main school-room will be 71ft. long by 19ft. broad.

LEGAL INTELLIGENCE.

TRADE CUSTOM.—Hubert Vergine, formerly in the employ of Mr. Broadwood, architectural carver, was summoned on Friday, at Marlborough-street, under the Masters and Servants Act, 30th and 31st Vict., cap. 141, sec. 4, for that, being a workman, he did unlawfully neglect to fill his contract. Mr. Froggatt, who appeared for the complainant, said this was a case of some importance to employers, the summons having been taken out by Mr. Broadwood more for the benefit and information of the trade than for the recovery of the amount in dispute, there being many workmen who had acted in the same way as defendant. Mr. Broadwood said the defendant was engaged by him about six weeks ago at the fixed wages of 36s. a week, and not by the hour, the agreement being that either might terminate the engagement at the end of any week, but not in the middle of a week. On Tuesday, the 29th of August, defendant left his employment for the purpose of obtaining one of higher wages. Some of the men in the trade set their masters at defiance, and appeared to consider they could do as they liked. He had only proceeded against the defendant for 12s. damage, but the injury was much more, as he had been obliged to disappoint customers. Mr. Antill, carver, Dean-street, said the old custom of the trade was to pay by the week, but some masters now paid by the hour. The men defied the masters, and did pretty well what they liked. Mr. Willis having addressed the Court for the defendant, called Mr. Wilson, who said he was an ecclesiastical joiner, and declared that the custom of the trade was for the men to leave their work whenever they thought fit, and that payment was by the hour. It depended on arrangement whether a workman was paid so much a day or by the week. It was the custom with ecclesiastical joiners to engage by the hour. Mr. Knox said the defence of payment by the hour being customary had failed. To make a custom in the trade it must be shown to be universal. That had not been done; but it had rather been shown that the engagement by the week was customary. As the present case was, no doubt, more for the purpose of settling the point than to put costs on the defendant, he would suggest that an arrangement should be come to. Subsequently, on the application of Mr. Froggatt, Mr. Knox made an order for 6s. only, and 4s. costs.

TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

Received: J. P.—C. P. E.—J. C.—W. B. A.—B. & Co.—Hy. Bond.—M. S., jun.—W. S. R.—C. W.—P. W. & Co.—J. H.—W. E.—L. P. T.—R. M. T.—T. B. A.—W. H. L.—R. B.—S. & Co.

H. B.—We suppose you refer to Nos. 767 and 778, Vol. XVII., which contained illustrations of furniture of new gas offices, Sunderland.

ASSISTANT ENGINEER.—Query next week.

A READER.—We hope to comply with your request in a week or two.

ANALYSIS.—Rather too chemical for our pages. Ask through the *English Mechanic*.

ERRATUM.—On page 184, in the description of the New (Roman) Catholic Church at Stanbrook, it should have been stated that the pavements are composed of tiles, the bands of the pattern being formed of glazed tiles, not of marble, and that they were supplied by Mr. Robert Minton Taylor, of Fenton, near Stoke-upon-Trent, not "Minton, Taylor, & Co."

Correspondence.

NOTES ON CARPENTRY.

To the Editor of the BUILDING NEWS.

SIR,—I see the writer of "Notes on Carpentry" says that to place a purlin otherwise than at right angles to the direction of the rafters is bad construction, because the pressure of the roof, whether it be of its own weight or the pressure of wind and snow, is at right angles with the rafters.

Now I imagine the pressure on a roof to be vertical and towards the eaves, and I think as a proof of this, you will always find when a purlin gives way, as it does sometimes when there is no principal rafter, that it bends towards the eaves; in that case I should say then the proper way to place a purlin is vertically. By that means you get about double the depth of a purlin placed at right angles with the rafters. I hope some one will correct me if I am wrong in my opinion.—I am, &c.,

CARPENTER.

WORK.

SIR,—Having served an architect several years, with no further holiday than a day occasionally (amounting during the whole period to some eight or ten days), this summer I requested, and had granted to me, a week's holiday; but find, much to my surprise, that my employer deducts such week's salary from amount due to me. I should feel much obliged if some one will inform me whether this is professional, gentlemanly, just.—I am, &c.,

WORKER.

[We consider it unprofessional, ungentlemanly, and unjust.—ED.]

INIGO JONES'S YORK STAIRS WATER-GATE.

SIR,—I observe floating about some exceptional concernment touching the half-buried position of Inigo Jones's water-gate, with even wondrous longing for its upheaval above the merely modern Embankment mound.

But why not wholly bury this inaugural symbol of a bad system—put together, like its compiler's scene-paintings, for the passing play—as having outlived both its purpose and teaching?

Its teaching! Do thoughtful English architects really wish still to cherish a quasi heap of lapidary learning, of odds and ends of effete Roman art, as a pedantic beacon, telling them tangibly what not to do, just as the owners of the style warned in words, *Miserum est aliorum incumbere fama?* Or does one solitary soul—regarding the long lineage of Gothic architecture as a bad dream of a dark night—still worship Jones's dismal display as an early monument of the revival of true principles, almost stifled, but, like science, grandly instaurated in his bright day?

The last accents of Shakespeare hung magnificently over the polity of that period, with Bacon's warning not to "corrupt the labours of predecessors" by copying their works. And following, while literature was thus resplendent, dazzling with unborrowed radiance, and the venerated father of modern philosophy spoke, what sort of light comedy do we find the "father of pure architecture [i.e., pure copyism] in this country" performing?

Compounding a water-gate, pieced with a base from this antique temple, a column from that, a cornice from a third, with lions *luna Nature*, such as Chinese puzzles are pieced—and altogether, in plain truth, no remote reminder of those counterfeit coins, struck in one age with the image and superscription of another,

that are but posingly preserved, if not considerably crushed.

I, Sir, yield to none in loving reverence for the old bygone days. A stone of archaic hours, carved by a true man, is, to me, a precious relic, because it portrays, more or less, the genuine feeling and actual life of that past which has made, and so far is in, the present. But while we strive earnestly to preserve all that it is good in ancient times, let us not, for Heaven's sake, bury ourselves in its rubbish and smother our children in its dust.—I am, &c.,

EDWARD L. TARBUCK.

25, Hanover-place, Clapham-road.

Intercommunication.

QUESTIONS.

[2314.]—S. Michael's and All Angels', Brighton.—Can any reader inform me who was the architect of S. Michael's and All Angels' Church, Brighton, and about the cost of building it?—AN ADMIRER.

[2315.]—Polychromy.—What is the best work published on "Polychromy," as applied to the interiors of buildings?—J. P.

[2316.]—Plastering of Walls.—Which is the best material, irrespective of cost, for internal plastering of walls—Keene's or Parian cement? The points wanted are: non-porosity, that the walls may be washable, and hardness, that they may not easily get damaged. What would be a suitable material to mix with either of these cements before being used, that the walls may dry a light stone-colour, without the necessity of being painted or coloured?—W. W.

[2317.]—Tar and Gravel Pavements.—Will any reader kindly inform me who I should apply to for particulars of the tar and gravel pavements that are now being laid in different parts of Lambeth? This material appears to be an excellent substitute for the more expensive French asphalt, and, although apparently not adapted to withstand the effects of carriage traffic, it is, nevertheless, an excellent preparation for the formation of footways.—M.

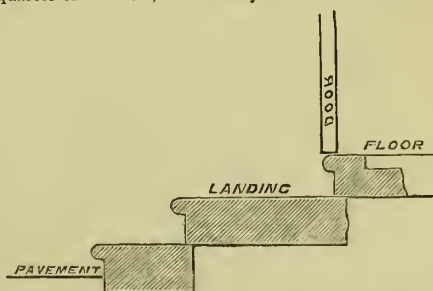
[2318.]—School Planning.—In planning schools, what is the superficial and cubical area required by the Council on Education for each child? In calculating for the number to be accommodated, has provision to be made for seating all at one time or supposing some to be standing in class?—COMMUNE-BONUM.

[2319.]—Blackboard.—Will any of your kind readers inform me the method of preparing the colour and finishing a blackboard, such as is used in schools for the instruction of music, &c., to write on with chalk?—CYRRO.

REPLIES.

[2308.]—Moulded Stone Steps.—The nosing ought not to project beyond line of door-frame; or, better still, be kept back half the width of the frame, so as to allow the weather-board of door to throw off the rain. If the floor behind door is of wood, the nosing ought to be of hard wood, not stone.—J. B.

[2308.]—Moulded Stone Steps.—The entrance-door should overhang the nosing of step about a quarter of an inch; in this way rain is excluded from



lobbies or vestibules, which in the other way it is not. It is not necessary to have the lower step the breadth of landing.—CLERK OF WORKS.

[2308.]—Moulded Stone Steps.—In answer to M. L. Wroug's inquiry, whether the nosing should project beyond line of compo front or stand back, I beg to inform him there is no rule to follow; one must be guided by circumstances. In this case, I think the nosing should be flush with reveal, so that the tread at door be equal to the bottom step; it would certainly look better when the door is closed.—AUGUSTINE.

THE ROYAL COMMISSION ON FRIENDLY AND BENEFIT BUILDING SOCIETIES.—The Royal Commission on Friendly and Building Societies met on Wednesday in the Clarendon Hotel, Edinburgh, when several witnesses were examined in reference to the operations of building and property investment societies, and Odd Fellows' lodges. The commissioners present were Sir Stafford Northcote, M.P., Sir M. E. Hicks-Beach, M.P., Sir Sidney H. Waterlow, Mr. Cully being assistant commissioner and Mr. Ludlow secretary.

WATER SUPPLY AND SANITARY MATTERS.

THE WATER SUPPLY OF PENGE.—A correspondent of a local journal writes: "It is hardly credible, but it is nevertheless the fact, that in a suburb of London like Penge we should do without a supply of water for two days. I have both written and telegraphed to the Laubeth Water Company, but can get no reply. Report says that there is a breakdown at the works. That may be; but at the best of times the supply is very indifferent, and in the case of cholera appearing amongst us would be wholly inadequate for the purpose of sanitary arrangements. Is it not time we had a more reliable supply for London and the suburbs?"

POLLUTION OF THE THAMES.—Notwithstanding all the laws which have been passed against the pollution of the Thames, the sewage of towns is still continuously poured into it, and in many instances in dangerous proximity to the sources whence some of the supplies of water for London are obtained. One disgraceful instance of this pollution is to be seen at the railway bridge at Kingston, where a sewer, discharging the most loathsome matter, carries the sewage of this large and increasing town into the water, converting the river itself into a huge sewer, and infecting its otherwise healthful banks with a fever-generating stench. One disagreeable feature of this pollution is that the filth attracts shoals of small fish, which feed upon the human excrement thus discharged. It is obvious that all the dangers of choleraic infection as well as the dreaded evils of parasitic generation, so much dwelt upon at the late meeting of the British Medical Association as likely to arise from the germs of town sewage, are incurred through these infractions of the law.

BATLEY.—The Mayor of Batley on Tuesday cut the first sod of the new Batley waterworks, which are to be constructed at Yatcholme, a little distance from the village of Holme, several miles beyond Holmfirth. The four reservoirs, when completed, will give a supply of two million gallons of water to the town of Batley per day; and had it not been for the rapid falls of the valleys there, the supply would have been two and a half million gallons per day. The whole cost of the undertaking will be about £200,000.

THE SEWAGE QUESTION AT CAMBRIDGE.—The Cambridge Board of Town and University Improvement Commissioners is on the eve of an important discussion, materially affecting alike the interest of the ratepayers and the health and comfort of the inhabitants of the borough and the members of the university. It is sought to amend the sanitary condition of the town by diverting its sewage from the River Cam. The subject is anything but new at the *locus in quo*, for from the minute-book of the Improvement Board the state of the Cam has for many years engaged their attention, and various attempts have been made to improve its appearance and sanitary condition. When the existing sewerage of Cambridge was constructed, the then authorities saw fit to cause the sewage to flow into the river from a dozen outfalls, at intervals between Newnham and Barnwell Pool—a distance of about a mile and a half. It so happens that seven colleges and a considerable portion of the town are immediately contiguous to this particular part of the river. Let it be assumed that the continuous deposit of the sewage of 30,000 people into a limited and sluggish stream has made that same stream "a mere elongated cesspool," and it will readily be imagined that those who have the misfortune to reside within reach of the exhalant gases naturally arising from such a pestiferous bed of uncleanness have an unpleasant, and during the warmer weather even dangerous time of it; whilst such as in boats disport themselves upon its frequently scummy surface—and these are legion—do so to find that every dip of the oar raises a volume of unmentionable filth and blackness. Between three and four years ago a stir was made, which culminated in the formation of a "Cam Improvement Committee," and a deputation from that body obtained permission of the conservators of the Cam to dredge the river from Jesus-green Sluice to Baitsbite Locks, and to restore it to its original width and depth, they taking all responsibility as to cost. Under the directions of Mr. Hawshaw, C.E., this extensive work was carried out as speedily as possible, at a cost of between £4,000 and £5,000 (the conservators giving £500 towards the fund, which was raised by subscriptions). Undoubtedly this widening and deepening conducted to improved rowing; but the work of purification was evanescent, for in less than two years the stream was reported to have again become so impure as to be not only "a public nuisance, but a danger to health." Permanent remedial measures have been persistently advocated by a few gentlemen; notably amongst these may be mentioned the mayor (Mr. Alderman Ford), Dr. R. M. Fawcett, Mr. Alderman Balls, and Mr. Dennis Adams. All, however, acknowledge the need of a remedy, and the only remedy for the evil is the total diversion of the sewage from the river. That it is not difficult of accomplishment we have the authority of Mr. Bazalgette, C.E., whose opinion is confirmed by the local engineers, Mr. R. Reynolds Rowe and Mr. G. W. Stephenson, the late and

present town surveyors respectively. Each of these gentlemen has reported upon his individual survey, and recommended irrigation as the best mode of utilising the sewage. To accomplish this diversion and utilisation, however, a local act was necessary. So at the close of last year the essential preliminary steps for that purpose were taken up to a certain point, several hundreds of pounds being expended therein. When, however, the board met on the 13th of December last, a majority of the commissioners then present decided that it was not expedient to take further steps during the then ensuing session of Parliament, it being believed that a Government measure would be introduced on the subject generally. In June last a joint committee, composed of members of the Improvement Board and Town Council, with a syndicate as representing the university, was appointed to consider the propriety of taking steps to obtain an act for the diversion of the sewage from the Cam. From instructions given by this committee the town surveyor has communicated with that eminent sanitary engineer, Mr. J. Bailey Denton, of Whitehall-place, London, who has paid Cambridge several visits for the purpose of considering the best mode of diverting and utilising the sewage. It would appear that early in October there will be a conference between the University syndicate and the Parliamentary committee for the purpose of receiving reports from Mr. Denton and the town surveyor on the matter. Various sites have been investigated with regard to the levels and geological formations of the district, with a view to select that which is most eligible for a sewage farm. The choice seems principally to lie between the following four localities—viz.,—Chersterton and Milton, Cherryhinton, Fen Ditton, and Teversham, all of which are within a radius of about three miles from Cambridge. Mr. Bailey Denton is of course in favour of irrigation. The cost of a similar scheme submitted last year by Mr. G. W. Stephenson was estimated at £28,000, which was much less than Mr. Bazalgette's plan. The whole of the present network of sewer outfalls will be concentrated into one grand intercepting sewer, in whatever scheme is adopted. The point of intersection where the intercepting sewer will cut off the present outfalls, will depend entirely upon the choice of scheme.

STAINED GLASS.

S. LAWRENCE JEWRY.—A memorial has been presented from the vicar, churchwardens, overseers, and ratepayers of the united parishes of S. Lawrence Jewry, and S. Magdalene, Milk-street, to the Court of Common Council, asking the Court to assist the memorialists to record by means of stained-glass windows, the ancient connection of the church with the Corporation. It is proposed to complete the series of stained-glass windows on the south side of the parish church by erecting a window by Messrs. Clayton & Bell, at a cost of £210, with two subjects, which shall refer to the administration of justice—viz., one from the Old Testament ("Solomon Sitting in Judgment"), and one from the New Testament ("S. Paul before King Agrippa"), and to place on the border escutcheons of some of the most distinguished of the chief magistrates of London, with a brass plate beneath the window, stating that the window was erected to commemorate the long-standing connection between the parishes and the corporation of London. Notwithstanding that the vicar and churchwardens some few years ago did very much, at their own sole cost, to improve the appearance of the Guildhall by clearing away an unsightly burial-ground, and throwing the whole space thus gained open, and although a handsome drinking fountain was erected by them between the church and the Guildhall, it was merely resolved "that the petition do lie on the table."

STATUES, MEMORIALS, &c.

MEMORIAL TO THE LATE DUCHESS OF SUTHERLAND.—A monument has been erected at the east end of the south aisle of Trentham Church, Staffordshire, in memory of the late Duchess of Sutherland, who died on the 27th of October, 1868. It is the work of Mr. Noble, the sculptor, and consists of a full-length figure, reclining between life and death, on the tomb as its final resting-place. There are also some effective representations of flowers—namely, the Lily, Star of Bethlehem, Passion Flowers, and the Eucharist. Other flowers are introduced over a veil, partially covering the brow. These are the Asphodel, Olive, and Amaranth, denoting life, peace, and immortality. All this part of the monument is in fine white Carrara marble. The tomb is principally of Sicilian marble, from a design by Mr. Robinson, of Whitehall-yard.

EQUESTRIAN STATUE OF THE PRINCE CONSORT AT HOLBORN CIRCUS.—At a meeting of the Court of Common Council, on Wednesday last, the Improvement Committee suggested, in a report brought up by Mr. Deputy Fry, that the equestrian statue of the late Prince Consort, by Mr. Bacon, which is to be presented by an anonymous citizen, should be furnished with a handsome and elaborate pedestal,

at a cost not exceeding 3,500 guineas. Mr. Deputy Lowman Taylor said that as the statue itself would only cost about £2,000, he would move that the expense of a pedestal should be limited to a similar sum. The amendment was carried, and it was referred to the Improvement Committee to obtain designs for the pedestal at the reduced but still adequate sum of £2,000.

Our Office Table.

NEW SUBURBAN RAILWAY.—The new railway connecting Blackheath and Greenwich with the station at Ludgate-hill, which has been constructed by the Chatham and Dover Company, was opened for traffic on Monday. The new line, which is three miles in length, commences by a junction with the Crystal Palace High Level line of the company at Nunhead, and passing through Lewisham and Brockley, has its present terminus at Blackheath-hill, the ultimate intention of the company being to carry the line forward to a further distance of four miles, where it will form a junction with the North Kent line and the South Eastern system at Charlton. In addition to the Nunhead and Blackheath-hill stations, there are two intermediate stations at Lewisham and Brockley.

RAILWAY EXTENSIONS IN EGYPT.—The *Delta*, which left Southampton on Saturday, took out 20 civil engineers, who are going out to make a survey for the Khedive of Egypt for a line of railroad 600 miles long, through the Nubian desert, beginning at the second cataract on the Nile. This railroad, if formed, will, in connection with the navigable portions of the Nile, be the means of effecting a rapid communication between Lower and Upper Egypt. The survey will take about six months to accomplish, and if the report of the engineers be favourable the railway will, it is expected, be commenced at once, and completed in about ten years.

ASPHALTE AT A DISADVANTAGE IN CONNECTION WITH TRAMWAYS.—On Sunday afternoon and evening a scene of the greatest confusion prevailed at S. George's-circus, at the south end of the Blackfriars-road, in consequence of nearly every car passing the points and curves getting off the line. This state of things has continued during the whole of the previous week. The roadway extending along the Walworth-road to the London, Chatham, and Dover Railway arch has been made up of asphalt, and the traffic along this part has so worn down the roadway that the rails are in some portions half an inch above the asphalt. Whatever advantages there may be in asphalt in many respects, it does not seem to answer for the tramways, as it gradually wears down, leaving the rails exposed. The conductors of the omnibuses state that the strain upon the spokes of the wheels is very severe in consequence of jerking against the rails, and necessitates the examination of them every day or two instead of once a month as heretofore.

GAOL SITES.—The inhabitants of Brixton and South London (says the *Central Press*) deserve the sympathy of all well-regulated minds. They have already a prison in their midst, and it is now proposed to enlarge, if not entirely rebuild, that unpopular architectural ornament. It is urged that a large prison, in a picturesque and populous locality, is a nuisance of a kind calculated to deteriorate the value of property, and it cannot be doubted that the erection of an ugly gaol amongst the West-End aristocracy would speedily cause an emigration. It is bad enough to be reminded of one's possible end by the contemplation of a workhouse or a churchyard, but the constant suggestion, through the presence of a gaol, that human nature is fallible, is quite superfluous. Besides there really is no reason why prisons should be erected in the midst of large cities. They might just as well be built in places where land is cheaper. The ladies and gentlemen who receive the careful attention of judge and jury are generally driven from the court to their place of future abode, and the carriage might readily set down its occupants a little further on.

A NEW PUBLIC PARK FOR DUNDEE.—A park, which has been provided at a cost of about eighteen thousand pounds, was thrown open to the public at Dundee on Wednesday. The Earl of Dalhousie took part in the proceedings, and planted a tree commemorative of the event, as did also the Provost. Rain fell during the whole of the ceremony.

MR. RUSKIN'S WORKS.—The first and fifth volumes of Mr. Ruskin's "Modern Painters" are out of print, and the other volumes nearly so. In the first volume of the uniform octavo edition of his works now in preparation, Mr. Ruskin has declared his intention to print very little of his "Modern

Painters," as his opinions have changed so much since the days in which he wrote that book. This resolution has (says the *Athenæum*) already led to the importation of copies of the American reprint of the favourite first volume of "Modern Painters."

NEW BRIDGE.—A new iron bridge is about to be erected over the river Ystwith, near Bryneithen, instead of the present timber one, at the sole expense of Capt. W. E. Richards, R.A., from designs furnished by Mr. G. H. Thomas, Liverpool.

EPHING FOREST.—Since the commencement of the long vacation, the Commissioners of Sewers of the City of London have filed a Bill in the Court of Chancery for the purpose of bringing to a practical issue the much-vexed question of the rights of the public in Epping Forest. The trustees of Earl Cowley, together with the other lords of manors within the limits of the forest, are the defendants, and the suit has been instituted for the purpose of obtaining a declaration that the plaintiffs are entitled to the rights of common and pasture upon the waste grounds within the forest, and of restraining the defendants from enclosing or building upon such land. Most of the defendants have filed a demurrer to the bill, and the demurrer will probably be argued early in Michaelmas Term before Lord Romilly, Master of the Rolls.

THE LATE WORKMEN'S EXHIBITION AT THE AGRICULTURAL HALL.—An unaccountable delay appears to have taken place in distributing the prizes awarded to the exhibitors at the recent Workmen's Exhibition at the Agricultural Hall. A correspondent of the *English Mechanic* writes:—"I have been waiting nearly twelve months in the expectation of receiving a medal, which was awarded me by the jurors of the Workmen's Exhibition; up to the present time, as far as I can see, my prospect of receiving the prize appears very visionary. So far as I have investigated the matter, the complaint is general among the certificate holders, who are loud in their censure against the management. I have given full expression to my opinions in letters, and I should like to hear what some of the exhibitors think of such a total disregard of the well-deserved claims of the bona-fide working man. The manufacturing element, and advertising, which were so largely represented, do not come within the category."

TECHNICAL EDUCATION.—The classes of the Birkbeck Institution are announced to commence on October 2nd. Instruction will be provided in all branches of science and art, in addition to the large number of other subjects set forth in the announcement. The pupils who have attended the examinations of the Science and Art Department during the present year have been more successful than on any previous occasion, and one member has succeeded in obtaining a scholarship at the Royal College of Science.

Chips.

A Journal of Zurich states that Professor Voegelli has discovered in the library of that town a decoration for a ceiling, painted by Holbein, and which was supposed to have been lost. This work has been sent to the exhibition of paintings by that master, at Munich.

At a late hour on Saturday night the extensive painting brush manufactory belonging to Messrs. Calmer & Sons, situate in the Hornsey-road, N., and a number of other buildings adjacent, were destroyed by fire. No loss of life occurred.

An exhibition of the fine arts, including paintings, sculpture in marble, and smaller carvings and drawings, is to be held in Calcutta in December next.

It is proposed to build a new station at South Penge Park, on the London, Chatham, and Dover Railway.

The Church of S. Michael, Cornhill, has just been reopened, after "renovation."

Farningham parish church is being restored, from the designs of Mr. Christian.

The Adelphi Chapel, Hackney-road, has just been greatly altered and enlarged, at a cost of £1,000.

At Rome, on the 6th inst., a contract was signed by the Syndic Pallavicini with the Banca Nazionale for the loan of thirty millions to be spent on the "improvement of the city."

It is proposed to restore St. Michael's Church, Southampton. Mr. C. E. Giles, of 7, Farnival's Inn, Holborn, estimates the cost of the proposed work at £3,115.

It is intended to restore Dulbrighton Church, from the designs of Mr. Bruton, of Oxford. The estimated cost is £700.

An additional building of considerable size is about to be erected at Woolwich in connection with the girls' cartridge factory, at the Royal Arsenal, which at present gives employment to about 700 girls.

We are glad to hear that Mr. C. H. Murray is a candidate for the office for supervision of the vacant lands of the Corporation of the City of London. Mr. Murray must be well qualified for the work.

The City Commissioners of Sewers on Tuesday last agreed to increase the salary of Mr. Swale, the sanitary superintendent, from £300 to £400 per annum, with an additional £50 in lieu of house accommodation.

The annual exhibition of paintings by modern Venetian painters is now open at Venice. The majority of the pictures are said to be very bad, and it is stated that the best Venetian artists will not exhibit their works.

Timber Trade Review.

PRICES, SEPTEMBER 18.—Timber, per load of 50 cubic feet: Quebec red pine (for yards and spars), £3 15s. to £4 15s.; ditto mixed and building, £2 15s. to £3 5s.; Quebec large yellow pine, £4 5s. to £5 5s.; S. John's and board pine, £4 to £4 15s.; building sizes, £3 5s. to £3 15s.; pitch pine, £3 to £3 15s.; Quebec oak, £6 to £6 5s.; rock elm, £3 10s. to £3 15s.; ash, £3 10s. to £4 15s.; masts (red pine), £4 to £6 10s.; large yellow pine, £4 to £6 10s.; Oregon, £7 to £10; New Zealand, £6 to £7 10s.; Quebec large birch, £3 15s. to £5; New Brunswick and Prince Edward's Isle, £2 15s. to £3 10s.; small averages, £2 10s. to £3 5s.—Deals, &c., per Petersburg standard: Petersburg best yellow, £13 to £13 10s.; Wyburg best yellow, £9 15s. to £10 10s.; Finland and hand-sawn Swedish, £7 5s. to £8; Petersburg and Riga white deals, £8 10s. to £9 5s.; Christiana deals (best sorts, yellow and white), £10 to £12 10s.; Norway deals (other sorts), £7 to £8; ditto battens (all sorts), £5 5s. to £7; Swedish and Gothenburg (good stocks), £10 to £10 10s.; ditto (common and thirds), £8 10s. to £9 10s.; Gefle and best Swedish, and best Gefle deals, £10 10s. to £12 10s.; Swedish battens, £8 to £9 10s.; Quebec best floated pine, £16 10s. to £18; seconds, £12 10s. to £13; thirds, £8 10s. to £9; first bright, £18 to £19 10s.; seconds, £13 5s. to £13 10s.; thirds, £8 15s. to £9 5s.

Trade News.

WAGES MOVEMENT.

LEEDS.—The marble masons at Messrs. Welch's, of Woodhouse-lane, Leeds, having applied for a reduction in the hours of labour, have been met with a lock-out. Some other masters have agreed to the reduction. The plumbers are about to ask for an increase.

STRIKE OF MASONS IN MANCHESTER.—Some 640 masons are employed in the building of the Manchester Town Hall—a larger number than has ever before been employed in the erection of one building in this country. On Friday last an under foreman discharged one of the masons for insubordination. The other men at once waited upon the head foreman and demanded the discharge of the under foreman. The head foreman requested time to inquire into the facts of the case, and as he would not give a decision at once the men struck, and the whole 640 left the place, but on Tuesday morning they returned to their work without any concession having been made to them. The reason of their return to work is supposed to be that the society would not recognise their strike.

THREATENED STRIKE IN THE WROUGHT-NAIL TRADE.—On Friday last a meeting of nail masters was held at the Dudley Arms Hotel, Dudley, Mr. T. Tinsley in the chair. The object of the meeting was to discuss the above question. About ten firms were represented. After a three hours' discussion, it was unanimously resolved "to adopt and pay by the net workmen's list of September 15, 1869 (with the exception of spike and plate nails), to take place to-morrow, September 16, 1871." This resolution is not satisfactory to the workmen, and a strike will ensue. From what can be gathered as to the general feeling among the men, the strike will be the most disastrous one which has taken place for many years.

BARNESLEY.—A conference of master builders and the representatives of the bricklayers on strike was held on Monday week. Nearly all the firms in the town were represented. After some discussion, the masters informed the delegates present that they could not accept less than three months' notice, and that any change in the working hours, &c., must take place from the 1st of May, according to an agreement entered into some time ago. The strike has had the effect of stopping the erection of the new Lancashire and Yorkshire Railway station, and other buildings.

DUNDEE.—For some weeks past the scavengers of Dundee and Lochee have been agitating for an increase of wages, and on Tuesday week they sent in a petition to the Police Commissioners representing their wishes. They stated that they are paid at a much lower rate than the scavengers in Edinburgh or Glasgow, and want an increase from 14s. 6d. and 15s. 6d. to 17s. a-week. The men were paid their wages as usual on Thursday week, and as no increase was given there were bitter complaints. No strike, however, was apprehended, as it was believed that the men would continue to work until

they received an answer to their petition. They commenced work as usual on the following day, but after having held a meeting, they left work and came out on strike at ten o'clock forenoon. Some of the men in the other classes of the cleansing department were employed during the day in cleaning the streets with revolving brushes drawn by horses.

TENDERS.

CHESHUNT.—For the erection of S. Mary's Schools, Cheshunt. Mr. A. R. Barker, architect. Quantities supplied by Mr. F. W. Hunt:—

Walton	£1648	0	0
Pocock	1327	0	0
Sanders	1413	0	0
Patman	1404	0	0
Bentley	1345	10	0
Archer	1033	10	0

LONDON.—For laundry and fittings at S. Luke's Workhouse. Mr. H. Saxon Snell, architect:—

Crockett	£1800	0	0
Till	1800	0	0
Turner	1777	0	0
Thompson	1774	0	0
Manley & Rogers	1757	0	0
Brown & Sons	1755	0	0
Saul	1710	0	0
Crocker	1659	0	0
Bamford	1650	0	0
Wigmore	1635	0	0
Howard	1630	0	0
Brigman & Nuthall	1591	0	0
Perry Brothers (accepted)	1589	0	0
Wall	1559	10	0

LONDON.—For machinery, boilers and pipes, for laundry at St. Luke's Workhouse. Mr. H. Saxon Snell, architect:—

Jeakes & Co.	£1023	3	3
Elliott	990	0	0
Benham	810	0	0
Potter & Son	740	0	0
May (accepted)	690	0	0

MALVERN.—For the erection of a pair of villas at Malvern. Mr. H. Hadden, architect. Quantities supplied:—

Garbutt	£1456
Porter	1380
Mills	1313
Inwood	1280
Everal	1299

ROTHERHITHE.—For the erection of church for Scandinavian seamen, Commercial Docks, Rotherhithe. Mr. Edward Biven, architect. Quantities supplied by Messrs. Franklin & Andrews:—

Wood	£2600
Higgs	2274
Nixon & Son	2247
Macey	2175
Dove Brothers	2175
Nutt & Co.	2148
Jackson & Shaw	2050
Henshaw & Co.	2015
Nightingale	1999
Ennor	1979
Manu	1967
Hibbin & Trasler (accepted)	1892

CONTRACTS OPEN FOR BUILDING ESTIMATES.

HORBURY BRIDGE (near Wakefield), October 2.—For the erection of a fire-proof mill at Horbury Bridge. —John Kirk and Sons, Architects, Huddersfield and Dewsbury.

HUDDERSFIELD, October 4.—For the erection of a mill, teasing place, boiler-house, and long chimney at Milnsbridge, near Huddersfield. —John Kirk and Sons, Architects, Huddersfield and Dewsbury.

LEYTON, October 2.—For the construction of outfall and other works, at Leyton, in the county of Essex. —Robert T. Wragg, Clerk to the Leyton Sewer Authority, 7, Great St. Helen's, London, E.C.

CASTLEFORD, September 27.—For sinking and making trial wells in land near to the pumping station of the waterworks. —George Bradley, Clerk to the Board, Castleford.

DARWEN, October 4.—For the construction of a store and service reservoir, containing about 150,000 cubic yards of earthworks, with 5,000 cubic feet of ashlar masonry. —J. Duxbury, Clerk to the Waterworks.

PORTSMOUTH, September 26.—For the construction of works of private or house drainage, and all requisite works in connection therewith in the said borough for a period of twelve months. —S. J. Elliott, Clerk to the Board.

BRADFORD, September 29.—For the erection of a villa at Apperley. —L. Metcalf, Architect, Elizabeth-street, Horton-lane, Bradford.

BIRMINGHAM, October 21.—Architects are invited to send in plans for the restoration of S. Martin's church, to the rector, on or before the 21st day of October. Premiums for the first, second, and third best designs will be given.

CLIFTON, September 28.—For the supply of 1000 tons of large stone ("Black Rock," or some other stone of equal quality, to be approved of by the Guardians). —C. H. Hunt, clerk, Clerk's Office, Workhouse, Fishpond-road.

DUBLIN, December 31.—For 500 tons bridge rails, 40 tons wrought-iron tie rods, 25 tons spikes, 14 tons bolts, 1,100 Barlow's cast-iron chairs, and 30 cast-iron block chairs. —Address Iron, care of W. H. Smith and Son, Middle Abbey-street, Dublin.

DARLINGTON, September 25.—For a five-feet polished flag-course for the improvement of the foot-paths in Southend Grounds.—John Pease, Esq., proprietor.

BARNSELY, October 2.—For the erection of Baths at the west side of York-street.—William H. Peacock, Town Clerk, Barnsley.

STOCKPORT, September 29.—For the erection of a new Wesleyan Chapel (on the site of the old chapel) at Edgely, near Stockport.—W. Hill, architect.

KEIGHLEY LOCAL BOARD OF HEALTH, September 28.—For the purchase of tar and other ammoniacal liquor, for a term of one, two, or three years.—J. Laycock, superintendent.

BALDOCK, HERTS, September 25.—For providing and laying 3,800 lineal yards of stoneware pipe sewers, and the construction of the necessary manholes, lamp-holes, and other works connected therewith.—S. Feasey, vestry clerk, Baldock.

METROPOLITAN ASYLUM DISTRICT, September 29.—For a new sewer and road, boundary wall, and entrance gates to land at West Brompton, near the West London Cemetery.—W. F. Jebb, clerk to the Managers, 37, Norfolk-street, Strand, W.C.

OUDE AND ROHLKUND, September 27.—For the following works:—1. Wrought-iron superstructure for the bridge across the Ranganga. 2. Wrought-iron boiler-plate girders. 3. Ironwork for roofing of running engine shed at Lucknow.—C. C. Johnston, Managing Director, Oude and Rohlkund Railway Company, Limited, 110, Cannon-street, E.C.

STOCKPORT UNION, September 28.—For the supply of nine iron bedsteads, and four invalid bedsteads, with rackheads.—F. W. Johnson, Clerk to the Union, Union Offices, Stockport.

KILKENNY, October 2.—For the removal of the present S. John's bridge, over the River Nore, and erecting a new bridge, consisting of three cast-iron arches, about 40ft. span each, on stone piers and abutments.—Peter Burchaell, Esq., County Surveyor, County Surveyor's Offices, Court House, Kilkenny.

WORCESTER.—In Chaucery: Attorney-General v. S. David's, October 31.—For taking down and rebuilding S. Oswald's and Hame's Hospitals, Worcester.—Alfred Rawlinson, Chief Clerk; Cree and Last, 13, Gray's Inn-square, London, Relator's Solicitors.

METROPOLITAN BOARD OF WORKS, September 29.—For the construction of a brick sewer and the formation of carriageway and footways, with other works along the new street near Seymour-place, Upper York-place, Marylebone-road.—John Pollard, Clerk of the Board, Spring-gardens, S.W.

DUNDEE HARBOUR, September 25.—For the completion of Victoria Dock, the construction of a graving dock, and other works.—David Cunningham, Harbour Engineer, Works Office, Harbour Chambers, Dundee.

BATH AND OTHER BUILDING STONES, OF BEST QUALITY.

RANDELL, SAUNDERS & CO., Limited,
Quarymen and Stone Merchants.

List of prices at the Quarries and Depôts, also cost of transit to any part of the United Kingdom, furnished on application to

[ADVT.] BATH STONE OFFICE:
CORSHAM, WILTS.

TO ARCHITECTS.

GREEN ROOFING-SLATES.

As supplied to H.R.H. The Prince of Wales at Sandringham The Penmoye Sea-green Slates are specially adapted for Churches, Public Buildings, &c., &c.

(Less costly than ordinary Gothic Tiling.)

These durable and non-absorbent Slates can be obtained in sizes suitable for Gothic Architecture, at prices as under.

In Railway Trucks, Docks, Gloucester:—

	Per Equivalent to 1,200 Slates, per square
Best Green Slates 14 by 7 ...	2 17 6 ... 16s. 6d.
Do. do. 13 by 8 ...	2 17 6 ... 16s. 6d.
Do. do. 13 by 7 ...	2 5 0 ... 14s.
Do. do. 12 by 7 ...	1 18 6 ... 13s.
Do. do. 12 by 6 ...	1 7 6 ... 11s.

Prices of large Sizes, Cost of Transit, Reference Testimonials, and Sample Specimens may be obtained on application to

MESSRS. RANDELL & CO., Corsham, Wilts.

Specimens at Museum of Geology, Jernyn-street, Piccadilly, W., and at Architectural Museum, Tufton-street, Westminster.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

	LEAD.
Pig—Foreign . . . per ton	£17 10 0
„ English W.B. . . do	20 5 0
„ Lead Co. . . do	18 10 0
„ Other brands . . do	18 0 0
Sheet Milled . . . do	18 5 0
Shot, Patent . . . do	20 10 0
Red or minium . . do	20 10 0
Litharge, W.B. . . do	0 0 0
White Dry . . . do	25 10 0
„ ground in oil . . do	0 0 0

COPPER.

British—Cake & Ingot . . per ton	£74 0 0	£76 0 0
Best Selected . . . do	76 0 0	78 0 0
Sheet . . . do	76 0 0	81 0 0
Bottoms . . . do	81 0 0	83 0 0
Australian . . . do	75 0 0	77 10 0
Spanish Cake . . . do	68 0 0	70 0 0
Chili Bars, cash . . do	67 15 0	69 10 0
„ Refined ingot . . do	75 0 0	0 0 0
Yellow Metal . . . per lb.	0 0 6½	0 0 7½

IRON.

Pig in Scotland, cash . . per ton	3 1 0	0 0 0
Welsh Bar, in London . . do	7 10 0	7 12 6
„ Wales . . do	6 15 0	6 17 6
Staffordshire . . . do	8 10 0	8 15 0
Rail, in Wales . . . do	6 15 0	7 0 0
Sheets, single in London . do	9 10 0	10 0 0
Hoops, first quality . . do	9 10 0	10 0 0
Nail Rod . . . do	8 10 0	8 17 6
Swedish . . . do	9 15 0	10 2 6

OILS, &c.

Seal, pale . . . per tun	33 0 0	0 0 0
Sperm body . . . do	80 0 0	81 0 0
Cod . . . do	34 10 0	0 0 0
Whale, South Sea, pale . . do	32 10 0	33 0 0
Olive, Gallipoli . . . do	50 10 0	0 0 0
Cocconut, Cochlin, tun . . do	49 5 0	51 0 0
Palm, fine . . . do	37 0 0	0 0 0
Linseed . . . do	34 0 0	0 0 0
Rapeseed, Eng. pale . . do	45 5 0	45 10 0
Cottonseed . . . do	29 0 0	35 0 0

TIMBER.

Teak . . . load	12 5 0	13 10 0
Quebec, red pine . . . do	3 15 0	4 15 0
„ yellow pine . . . do	4 5 0	5 5 0
Quebec oak, white . . . do	6 0 0	6 5 0
„ birch . . . do	3 15 0	5 0 0
„ elm . . . do	3 10 0	4 0 0
Dantzic oak . . . do	4 10 0	6 10 0
„ fir . . . do	2 7 0	4 0 0
Meinl fir . . . do	2 15 0	3 5 0
Riga . . . do	3 0 0	3 10 0
Swedish . . . do	2 0 0	2 10 0
Masts, Quebec red pine . . do	4 0 0	6 10 0
„ yellow pine . . . do	4 0 0	6 10 0
Oregon . . . do	7 0 0	10 0 0
Lathwood, Dantzic, fm. . . do	3 0 0	4 10 0
St. Petersburg . . . do	4 15 0	5 15 0
Doals, per C, 12ft. by 3 by 9in. . . do	12 10 0	13 10 0
Quebec, white spruce . . . do	12 10 0	14 0 0
St. John, white spruce . . do	12 10 0	14 0 0
Yellow pine, pr reduced C . do	13 0 0	14 0 0
Canada, 1st quality . . . do	13 0 0	14 0 0
„ 2nd do . . . do	12 5 0	13 10 0
Archangel, yellow . . . do	12 10 0	14 10 0
St. Petersburg, yellow . . do	13 0 0	13 10 0
Finland . . . do	7 10 0	8 0 0
Menel and Dantzic . . . do	0 0 0	0 0 0
Gothenburg, yellow . . . do	8 10 0	10 10 0
„ white . . . do	8 10 0	9 0 0
Geñe, yellow . . . do	10 10 0	12 10 0
Soderham . . . do	8 10 0	12 0 0
Christiania, per C, 12ft. by 3 by 9in., yellow . . . do	10 0 0	12 10 0
Other Norway . . . do	7 0 0	8 0 0
Flooring boards, pr square of lin., first yellow . . do	0 9 0	0 10 0
First white . . . do	0 8 0	0 9 0
Second qualities . . . do	0 6 0	0 8 0

BANKRUPTS.

PUBLIC EXAMINATIONS.

October 13, D. Simmons, Charlton Kings, Gloucestershire, builder.—November 7, T. W. Hosegood and J. Turner, George-yard, Whitechapel, colour and varnish manufacturers.—November 7, T. G. and J. Jennings, Whitechapel-road, plumbers.—October 9, J. Gadsby, Derby, builder.—October 10, W. H. Haden, Dixon's-green, Dudley, and Sedgley, ironmaster.

BANKRUPT DIVIDEND MEETING.

October 6, L. Lloyd, Beekbury, Shropshire, late timber merchant.

DECLARATION OF DIVIDEND.

J. Jowett, Liverpool, timber bender, div. 3s. 6d.

PARTNERSHIPS DISSOLVED.

A. C. Wylie and G. Blaxland, Cannon-street, City, engineers.—Macleod & Sanders, Salford, plasterers, painters, and cement concrete makers.

FOR SALE, the entire PLANT of a small GAS-WORK, capable of making 30,000 feet per diem. Canal alongside.—Apply to Mr. Measeock, Norwood Green, Middlesex; or 15 and 16, Giltspur-street, E.C.

LOUGHTON PARK, ESSEX, near to the Station, FREEHOLD BUILDING LAND, reserved for good private residences, with paddocks and grounds, to be SOLD or LET on Building leases.—Apply to Mr. E. Littler, Upper Plaistow, E.

UPPER HOLLOWAY.—TO BE LET, several plots of capital BUILDING LAND adjoining a Metropolitan station now in course of erection on the Midland Railway. Term 85 years. Ground rent very moderate. The land possesses very valuable frontages to the high road and other thoroughfares, and it is specially adapted for semi-detached villa residences; roads and sewers made. For terms, &c., apply to Messrs. Newman and Lyon, Solicitors, 7, King's Bench-walk, Temple, E.C.

SCHOOL-BOARD FOR LONDON.—To Surveyors, Auctioneers, Estate Agents, and Property owners.—The Schoolboard for London, having in contemplation the erection of Schools within the several Districts mentioned below, are prepared to receive OFFERS of SITES, of not less than a quarter of an acre in area, within such Districts. Offers (on printed Forms, which will be sent on application) containing full particulars, and accompanied by Plans of the Property, to be sent to the Clerk of the Board.

CITY AND TOWER HAMLETS.

A.—A District bounded on the north-west by Bishopsgate-street, on the north-east by Commercial-street, on the south-east by Whitechapel High-street, and on the south-west by Houndsditch.

FINSBURY.

B.—A District bounded on the north by the Regent's Canal, on the east by Caledonian-road, Upper Southamp-street, and Southampton-street, on the south by Pentonville-road, and on the west by York-road.

C.—A District bounded on the north by the Cattle Market, on the east by Caledonian-road, on the south by the North London Railway, and on the west by York-road.

P.—A District bounded on the north-west by Clerkenwell-green and Aylesbury-street, on the east by St. John-street, on the South by Charterhouse-street, and on the west by Farringdon-road.

GREENWICH.

D.—A District bounded on the south, west, and north by the township of Hatham boundaries, and on the east by London, Brighton, and South-coast Railway.

HACKNEY.

E.—A District bounded on the north by Acton-street, Livermere-road, Shrubland-road, and parts of Lansdowne-road and West-street, on the east by Cambridge-road, on the south by Hackney-road, and on the west by Kingsland-road.

LAMBETH.

F.—A District bounded on the north-east by Kent-street, on the south-east and south by Warner-street, Portland-place, and New Kent-road, and on the north-west by Newington-caneway, Stones'-end, and Blackman-street.

Q.—A District bounded on the north-west by Battersea-road, on the east and south by the Crystal Palace Railway and on the west by Latchmere-road.

MARYLEBONE.

G.—A District bounded on the north-west by St. John's Wood-road, on the north-east by Grove-road, Grove-place, and Lisson-grove North, on the south-east by Marylebone-road, and on the south-west by Edgware-road.

H.—A District bounded on the north by Euston-road, on the east by Tottenham Court-road, on the south by New Cavendish-street, Upper Marylebone-street, and Howland-street, and on the west by Portland-place and Park-crescent.

I.—A District bounded on the north by Cumberland Market and Edward-street, on the east by Hampstead-road, on the south by Euston-road, and on the west by Albany-street.

J.—A District bounded on the north by Crowndale-road, on the north-east by Old St. Pauls-road, on the south by Grenville-street and Aldenham-street, and on the west by Eversholt-street and Seymour-street.

SOUTHWARK.

K.—A District bounded on the north by Spa-road, on the north-east by the South-Eastern Railway, on the east by St. James's-road, on the south by Lynton-road, and on the west by Balaklava-road, part of Alma-road, and Amelia-row.

R.—A District bounded on the north and east by White-street and Long-lane, on the south by Star-corner and Bermondsey New-road, and on the west by Kent-street and the Old Kent-road.

TOWER HAMLETS.

L.—A district bounded on the north by the boundaries of the parish of Stepney, on the east by Globe-road, on the south by Mile End-road, and on the west by Cleveland-street and the boundaries of the parish of Stepney.

N.—A District bounded on the north-west by Whitechapel High-street and road, on the east by Turner-street, and on the south by Commercial-road.

O.—A District bounded on the north by Mile-end-road, on the east by Johnson's-street, on the south by Bull-lane, and on the west by White Horse-lane.

CHELSEA.

M.—A District bounded on the north by King's-road, on the east by Manor-street, on the south by the Thames, and on the west by Beaufort-street.

WESTMINSTER AND FINSBURY.

S.—A District bounded on the north by Great Queen-street and the northern boundaries of Lincoln's Inn-fields and Lincoln's Inn, on the east by Chancery-lane, on the south by the Strand, and on the west by Drury-lane and Drury-court.

*. The usual Commission will be paid to Agents on the completion of purchases.

Offices of the Board, 33, New Bridge-street, E.C.,
September 6, 1871.

MORTGAGES.—MR. HAYNES has clients prepared to ADVANCE SUMS of MONEY to any amount on mortgage of Freehold and Leasehold property, and upon Deposit of Deeds. Advances made upon unfinished property. Several plots of Freehold land to be let on building leases with advances.—John F. Haynes, Solicitor, 3, Warwick-court, Gray's Inn, W.C.

THE BUILDING NEWS.

LONDON, FRIDAY, SEPT. 29, 1871.

FIRE-BRICKS.—IV.

BY CHARLES TURNER, C.E.

NEW SLIDING-PLATE.

A NEW sliding-plate for the press was designed by the author, with self-acting finger to take off the brick in case the man should fail. This would have saved the whole of the oil used for the bed-plate, and would also have enabled the press to be worked at double the speed. It was not used on account of the suspension of the works.

DRYING BY ARTIFICIAL HEAT.

During the summer months the clay, previously to crushing, and the fire-bricks, when made, were all dried out of doors. In order to work through the winter a drying-shed was constructed, 150ft. \times 25ft., with one large central flue, 3ft. \times 2ft. 6in., covered with iron plates, and a series of small flues at each side, diverging from two flues at each side of the centre flue at the stoke-hole, and converging into one flue at each side of the centre flue at the chimney-stack. The centre flue was used for drying lumps and other large goods, and the spaces at the sides for the fire-bricks. A space of 25ft. at the stoke-hole end was used for drying clay; a similar space at the chimney end as a working-shed for three moulders.

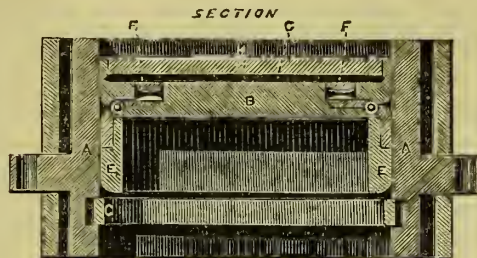
NEW KILN.

The chimney end of the shed was connected with the kiln-house of a new down-draught kiln, erected on account of the difficulty in lining the fire-bricks properly in the common kiln. This kiln was of the form illustrated and described in Fig. 4.

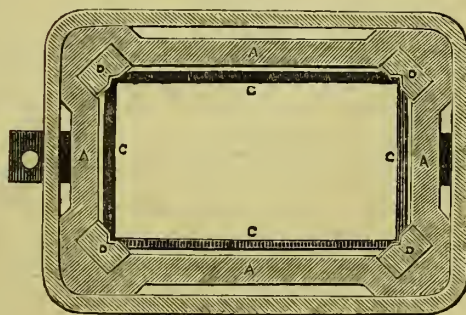
15,000 bricks. When the chimney was removed to the outside of the kiln house, the kiln held 17,000 bricks.

FUEL.

The fuel used was the same as that used for the common kilns, Welsh coal to com-



1 1/2 INCH SCALE PLAN



mence with and Wylam coal to burn off. The quantity of coal used to burn 17,000 bricks was about eight tons. With this they were burnt thoroughly to the proper pitch, with scarcely any difference in size, and not more than 200 to 300 waste bricks in every kiln, which could all be used for inferior purposes.

An expanding die was, therefore, designed by the author, in which, by the introduction of wood packing pieces of suitable shapes, bricks of any form could be moulded. A press was also designed for making lumps of any size, but neither of these plans were tried, owing to the difficulties of the company. The principle of the expanding die was as in sketch and description Fig. 5.

DESCRIPTION OF EXPANDING MOULD.

AA. Cast iron mould. BBB. Plunger. CCCC. Four packing pieces of brass. D. Vulcanised indiarubber blocks, which keep the packing pieces free of the mould. EE. Movable sides turning on the centre E', and having arms projecting at right angles, which press on the springs, FF. G. Sheet of vulcanised indiarubber to prevent any risk of breakage. FF. Springs to bring sides of mould back to first position. H. Iron plate resting on G.

PRICE OF PRESSED FIRE-BRICKS.

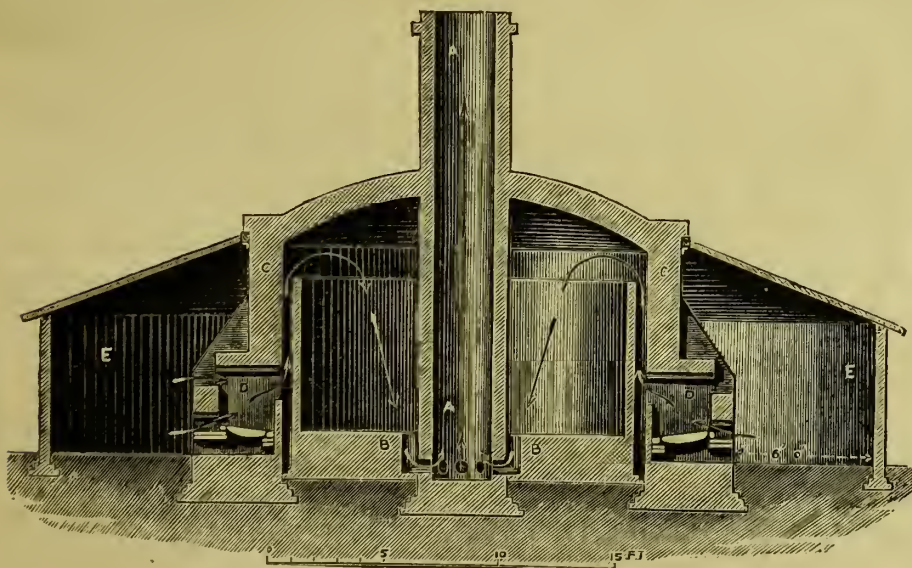
The quality of these pressed bricks proved to be so superior to the hand-made that the company was easily able to obtain 5s. extra per 1000 for them, while at the same time the freight to London was reduced from 6s. 8d. to 6s. per ton (or 2s. per 1000), costing 18s. per 1000. Orders increased, and there appeared a fair prospect of doing a good trade, which would soon have been a very large one, if the arrangements could have been carried out for supplying the extra plant required and arranged. The total profit was 17s. 6d. per 1000.

WORKS WHERE USED.

The pressed bricks were used in large quantities at the South Western Pottery, the Branksea Pottery, the Poole Gas Works, the Peninsular and Oriental Steamship Company, the Union Steamship Company, Messrs. Maudslay & Co., and many others, and were also favourably reported upon by the Landore Liemen's Steel Works, Thames Plate Glass Company, Dorset Iron Works, and others, and were in all cases found to last longer than the Stourbridge, Newcastle, or Welsh bricks.

SUMMARY.

An endeavour has been made in the foregoing remarks to describe briefly the nature of fire-proof materials used for making bricks and other fire-clay goods, mentioning the most infusible substances, and comparing them together. The desirability of conducting a series of experiments to decide the relative fire-proof value of these substances was then referred to. It was stated that, in referring to silica, alumina, magnesia, and carbon, as the most infusible substances, it was supposed that they would be subjected to a dry heat, their behaviour differing very greatly when in combination with fluxes. The most refractory fire-clays were then mentioned, in which the component parts were chemically combined, and inferior fire-bricks were referred to, in which the component parts were artificially combined. The most important qualities of fire-bricks were stated to be their power to resist melting and to resist the expansion of the heat which causes them to crack or part asunder. The best description of fire-bricks were then stated, and an analysis given of the best English fire clays. The Poole clays were mentioned, more especially the Beacon-hill clay, so well known for its great infusibility. The beds of clay at Beacon-hill were described, as also the uses to which they are applied, and an analysis given of the best clay. The principle of making a fire-brick was shown to be that of making it as porous as possible, and thus allowing for the greatest amount of expansion, and the two usual methods of obtaining this quality were described. The mode of pro-



SETTING KILN.

A chequer was laid first upon the floor of the kiln three or four courses deep, to keep the draught open, and the bricks were then set in wide bolts, parallel to the diameter of the kiln, and reaching to within about 18in. of the crown, a few courses of open work being laid on the top to prevent the dust and small particles of coal carried up by the blast from falling through and choking the spaces between the bolts.

DRYING, BURNING, AND COOLING DOWN.

The time occupied in drying was very little, and the kiln could be raised to its full heat in about 48 hours. The time of full fire was about 36 hours. Cooling down occupied usually about 72 hours; so that the kiln could be set, burned, drawn, and lit again in about eight days. The kiln with the chimney in the centre held about

COST OF BURNING.

The price paid for burning was rather excessive, as the kilns were new to the country burners, and a skilled burner had to be employed. The cost for labour in burning, setting, and drawing was 4s. 6d. per 1000. This amount was reduced with a larger kiln to contain 30,000 subsequently erected to 4s. per 1000, and another season would have brought it down to 3s. per 1000.

ARCH BRICKS AND LUMPS.

All bricks of unusual size and shape and all lumps were moulded by hand, the stuff being beaten into the lump moulds with heavy rammers. The cost of fitting a special mould to the press was from £10 to £15. It was, however, found, after testing these bricks to a considerable extent, that they would not withstand wear and tear, or fire to nearly the same extent as the pressed bricks.

ceeding at Beacon-hill was then described, referring to the various stages of the work in their regular order—viz., rubbing clay, cutting and weathering, grit digging and carting, drying and grinding the clay, mixing the clay and grit, moulding, crowding, description of kilns, and setting, drying, and burning, amount of fuel used, price of fuel, probable heat required, drawing and stacking, waste. Statements were then given of the size and weight of the bricks when burned, their cost in places, and total cost of making and burning. The results of experimental trials with these bricks were given, also the manufacture of and experiments with fire-clay cement. The use of rough stuff instead of grit was described in detail, including the various methods of mixing, and proportions used, and mode of workmanship. The result of experiments with the altered form or mixture were given, and also the use of calcined clay in various proportions, with the above mixtures. The favourable results of the fire-clay cement so manufactured were stated. The advantage of a closer combination between the component parts of the fire-bricks was referred to, and the means adopted for pressing them described in detail—viz., the press used and the improvements upon it, including the alteration to mouth-piece of pug-mill (Figure 1), the new press (Figure 2), cost of working it, new cutting-off apparatus (Figure 3). Oiling the bed-plate of press and proposed new slide-plate, drying by artificial heat, were then described, as also the new kilns erected (Figure 4), and the manner of setting and the cost of burning the same. The manufacture of bricks of unusual size and shape by hand was briefly referred to, and they were stated to be greatly inferior in quality to pressed bricks. An expanding mould (Figure 5), designed and made for the press to make bricks of any shape within certain limits of size, was referred to and described, and also a press for making lumps of any size, and, finally, a statement of the improved price obtained for the new fire-bricks, the profit in making them, and the works at which they were used.

CONCLUSION.

The results obtained from the manufacture and experiments at Beacon Hill may be summed up as follows:—1st. That it is always better to select a fire-clay in which the silica and alumina are chemically combined. 2nd. That instead of mixing free silica with the fire-clay to produce a porous body, it is better to mix with the clay rough stuff burnt from the same clay. 3rd. That although the infusibility of the clay selected for making fire-bricks is the most important point, the mechanical combination of the component parts is almost of equal importance. 4th. That this combination is best obtained by pressing the green mass of clay and rough stuff firmly into the moulds. 5th. That the less a fire-brick shrinks in the first burning the better it is likely to withstand heat. 6th. That fire-bricks should, if possible, be burnt in a heat equal to the greatest heat they are required to withstand. 7th. That a thoroughly effective machine for pressing bricks green is still a desideratum, but that the author is of opinion such a machine can be constructed to make almost indestructible fire-bricks at a very moderate cost, suitable materials being used.

NOTES ON CARPENTRY AND ON STRAINS IN STRUCTURES—VIII.

HAVING treated of what may be called the apparent properties of the timber commonly used in carpentry, we will proceed to those which lie hidden from sight, on which its strength depends, and which can only be ascertained by experiment. Experiments on the strength and deflection of timber have been quite numerous, nearly every one who has had much practice in its

use having made from time to time his own experiments, but few private experimenters (as may be said) have had sufficiently extensive opportunity to render their own observations complete for all cases; and perhaps the chief use of such experiments lies in the satisfaction one feels in an ocular demonstration of the truth of propositions made by those whom we take as authorities. The authorities in this matter are Muschenbroek, Buffon, Rondelet, Morin, Robison, Young, Bevan, Tredgold, Rennie, Barlow, and Hodgekinson. Of all these the experiments made by Professor Barlow at Woolwich, and by Mr. Hodgekinson at Manchester, are most to be relied upon.

The strains produced in a beam by a load placed crosswise of it, being the most important and often to be considered, we will consider first. In a former article we said that the power with which a beam resists the strains produced in it by a load is inversely as its length, directly as its breadth, and as the square of its depth. Now, whatever the actual dimensions of the scantlings may be which are experimented on, they can all be reduced, on this supposition, to a simple dimension of a foot long, or rather a foot between the bearings, an inch wide, and an inch deep; and the weight that would break a bar of this size, if placed upon the centre of it, and supposing it to be supported at both ends, is the measure of the transverse strength of the particular kind of wood experimented on. Thus, if we were to find, on trial, that a scantling of red pine, 2in. wide, 3in. deep, and 4ft. between the bearings, broke with a weight of 2,000lbs. on the centre of its length, we should deduce from that experiment a constant, or co-efficient, for the breaking weight, of 444; thus, according to the proposition above given, if a bar 2in. in breadth would break with 2,000lbs., another bar of the same material, one inch broad, would break with 1,000lb.; and if a bar an inch broad and 3in. deep would break with 1,000lb. weight on the centre, another bar 1in. deep would break with a weight of $\frac{1000}{3 \times 3} = \frac{1000}{9} = 111\text{lb.}$ in the centre; but

the length of the bar supposed to be under trial is 4ft., and if a bar 4ft. long, an inch broad, and an inch deep, would break with 111lb., another bar 1ft. long, 1in. broad, and 1in. deep, would break with a weight of $111 \times 4 = 444\text{lb.}$ This is the actual breaking weight of a bar of red pine of these dimensions, and in calculating the dimensions of any other bar or beam of red pine, to carry any other weight, 444 is called the constant multiplier of such calculation, or the co-efficient of strength, when the beam of which the dimensions are to be found is to be loaded in the same manner, that is, in the middle, the beam being supported at both ends; and, to reverse the process, the breaking weight of a bar of red pine of 4ft. bearing, 2in. wide, and 3in. deep, would be found thus: W , the breaking weight in lbs.

in the centre = $\frac{444 b d^2}{l}$; that is to say, 444 times the breadth in inches, multiplied into the square of the depth of the bar in inches, and divided by the length in feet, thus: $\frac{444 \times 2 \times 9}{4} = 2000$, the breaking weight in lbs. as before.

Again, to take a larger beam, let it be required to find what dimensions a beam of 12ft. bearing should have, to carry six tons in the centre, or 13,440lb. Let any convenient breadth be assumed—say, in this case, 12in. Now, if the beam is to carry an actual load of six tons, its breaking strength, or ultimate strength, must be, of course, much greater. How much greater, or what ratio the safe load should bear to the breaking weight, has never been agreed upon. Some have ventured so far as to recommend a permanent load of one third of the break-

ing weight, others one fourth, and others, again, not more than one tenth. A good deal depends upon the kind of load—whether it be a steady load or a moving, or live load; and a good deal, also, on the quality of the piece of timber; but, assuming a good sound quality and a steady load, about one fifth seems to be as much as ought to be reckoned upon. If, then, we adopt one fifth, the breaking weight of the beam we have taken for an example should be $6 \times 5 = 30$ tons, or 67,200lb. The depth of the beam would then be found, thus:

$$d^2 = \frac{l W}{444 b}; \text{ or thus, } d = \sqrt{\frac{l W}{444 b}}.$$

l , the length in feet, being 12; W , the breaking weight in lbs., in the centre, being 67,200; b , the breadth in inches, being 12; $d^2 = \frac{67,200 \times 12}{444 \times 12} = \frac{67,200}{444} = 151$, and the square root of 151 = $12\frac{1}{2}$ nearly = the depth required in a beam of red pine of sound quality, the length of bearing of which is 12ft. and breadth 12in., in order to carry a load of six tons in the centre, without straining the fibres of the wood to more than one fifth of their ultimate strength.

All these dimensions are transmutable amongst themselves; thus, if the breadth had been required, the length, depth, and weight being given, the figures would have stood thus: $b = \frac{l W}{444 d^2}$.

If the greatest safe length had been required, thus, $l = \frac{444 b d^2}{W}$.

If the breaking weight had been required, thus, $W = \frac{444 b d^2}{l}$.

And in all cases, if we put W = the breaking weight, l = the length, b = the breadth, d = the depth, and c = a constant multiplier, or co-efficient of strength, to be determined by experiment, $l W = c b d^2$.

We showed in a former article that in respect of central and distributed loading, a distributed load may be twice as much as a central one without producing greater strains in the beam; and in the case just supposed 12 tons might be uniformly distributed over the beam, while the strains would remain of the same intensity (at the centre) as under a central load of 6 tons; or, on the other hand, the load remaining 6 tons, but being distributed uniformly, the length of the beam might be 24ft. instead of 12ft., or the breadth 6in. instead of 12in., or any other combination of dimensions and weight might have been made that would have produced the result of $\frac{444 b d^2}{l} = W = 30 \text{ tons} = 67,200\text{lb.}$

as before.

If Riga fir had been in question, the constant would have been 369, instead of 444; for English oak, 557, and for teak 820, according to Professor Barlow's experiments.

The other ways in which timber is commonly strained in structures is by direct tension, as in tie beams, king and queen posts of roofs, the tie bars of lattice bridges, the top bar of a framed gate, &c., and by direct compression in the direction of the length, as in struts, principal rafters and collar beams of roofs, braces, crane jibs, story posts, &c. The tensile strength of wood is proportionate to the number of fibres in the cross section, or to the sectional area, and is usually measured by the square inch. Thus red pine will just bear before it breaks about 12,000lb. for every square inch of the sectional area of the piece, Riga fir about the same, oak 10,000lb., and the best teak 15,000lb.

The compressive strength, or power to resist crushing, follows a different law, for it decreases with the length of the piece. If the length is not more than about eight times the thickness, the crushing strength of red pine is about 6,000lb. per square inch, Riga fir about the same, English oak about 8,000lb., and teak 12,000lb. But when posts exceed

in length ten times their thickness they bend under loads, and at sixteen times their thickness are incapable of resistance.

The manner in which direct tensile strain and direct compressive strain are produced in framed timber structures is so imperfect in respect of the direction of the forces being coincident with that of the pieces, that although we may venture to assign one fifth of the breaking weight as the utmost limit for a safe load when applied transversely, we cannot approach this ratio in cases of direct tension or compression; and probably one tenth is as much as ought ever to be calculated upon for safety.

The formula deduced by the late Mr. Eaton Hodgkinson from numerous experiments on the strength of square oak posts is

$$W = \frac{3960 \, l \, b^3}{4l^2 \times 5 \, l^2}$$

When l = the length in feet, b = the breadth in inches, W the breaking weight in lbs. Posts of American fir or spruce may be calculated upon the datum that the compound of crushing force and stiffness of fir is to that of oak as 25 to 40.

As to the ultimate strength of timber, however, and what portion of it we please to assign, in the exercise of our judgment, as being a safe load, there are many cases in which neither consideration can have place, for a horizontal beam may bend so much under even a safe load as to cause inconvenience, if nothing more. In these cases the deflection of beams under given loads is the consideration to be had, and it is directly as the weight as the cube of the length, and inversely as the breadth and cube of the

depth, and is represented thus: $D = \frac{b \, W}{E \, b \, d^3}$.

When D = the deflection in inches; l = the length in feet; W = the weight in lbs.; b = the breadth, and d the depth in inches; E = a constant multiplier or co-efficient of stiffness, the value of which is derived from experiments on the different kinds of woods, and was found by Professor Barlow to be, when the beam is fixed at one end and loaded at the other—

For English oak	210
For Riga fir.....	192
Norway spar	211
Memel fir.....	120
Mar Forest fir.....	94
Pitch pine	177
Red pine	266
Larch	120
Elm	101
Teak	349

These are the values of E , deduced from experiments on beams fixed at one end and loaded at the other. When a beam is fixed or supported in any other way, as, for instance, where it is supported at both ends and loaded in the middle, or loaded uniformly, or otherwise, the deflection varies under the same load according to the manner of loading.

When a beam is supported at both ends and loaded in the middle, Mr. Barlow deduced the law that it is strained by a given weight to only one-sixteenth part as much as it would be if fixed at one end and loaded at the other, from the following reasoning:—"The deflection of a beam fixed at one end and loaded at the other is equal to that of a beam of twice the length supported at both ends and loaded in the middle with twice the weight." This will be evident by referring to Fig. 1 in the first of this series of "Notes" (BUILDING NEWS, July 28). "Consequently when the weights are the same the deflection in the first instance is to that in the second as 2 is to 1; and when the length and weight are both the same the deflections will be to each other as 16:1, for the strain will be 4 times greater on the beam fixed at one end than on that supported at both" (as we said, because the effective length in the one case is twice that in the other, and at the same time the weight is twice as much, and $2 \times 2 = 4$), "and

therefore, all other things being the same, the element of deflection will also be 4 times greater, also the entire deflection is as the element of deflection into the square of the length, and, according to the supposition, the length is double; whence, upon the whole, it appears that the deflection in the one case is to that in the other as $1:4 \times 4$, or as $1:16$."

The deflection under any given form of loading may be ascertained by the following formulæ. When the beam is fixed at one

$$\text{end and loaded at the other, } D = \frac{b \, W}{E \, b \, d^3}$$

When fixed at one end and uniformly loaded, as in a cantilever,

$$D = \frac{3}{8} \times \frac{b \, W}{E \, b \, d^3} = \frac{375 \, b \, W}{E \, b \, d^3}$$

When supported at both ends and loaded in

$$\text{the middle, } D = \frac{b \, W}{16 \, E \, b \, d^3}$$

When supported at both ends and uniformly loaded,

$$D = \frac{5}{16} \times \frac{b \, W}{E \, b \, d^3} = \frac{625 \, b \, W}{16 \, E \, b \, d^3}$$

It is necessary to observe that the co-efficients of strength and of stiffness here given from Professor Barlow's experiments were deduced from trials with pieces of wood of the best quality, and that various experiments with balks of Memel, Dantzic, and Riga fir of ordinarily good quality, with the usual long sound knots, have shown deflections of from one-third to one-half as much more as they give; so that in estimating the probable deflection of any beam of ordinary quality in practice a coefficient must be chosen which approaches those here given more or less in the same degree in which the quality of the timber approaches more or less to the best quality.

SCULPTURE AT THE INTERNATIONAL EXHIBITION.*

By RICHARD WESTMACOTT, Esq., R.A., F.R.S.

(Concluded from p. 218.)

IT may be mentioned with respect to contributions of British sculptors that nearly all the works now exhibited have been already before the public, and have undergone public criticism. It is therefore unnecessary to subject them, on this occasion, to a repetition of this ordeal. Sculpture may, for convenience, be classed under three leading heads. In the first rank may be placed those productions which, dealing with the human form, show invention and original thought in conception and treatment, such as in poetical and historical subjects. Even domestic, or familiar, and *genre* works, if they are illustrative, may also be included in this category. In the second may be included portrait sculpture in its several branches of statues, busts, and medallions, &c. The third and last would comprehend sculpture intended for decoration, as compositions for pediments, friezes, spandrels, and other architectural accessories, not, as in the first division, illustrative of specific subjects. In this class would also be included works in carving, castings, chasing in metal, and *repoussé* work, being imitations (treated in an artistic spirit) of natural objects, especially the human and animal form, with flowers, fruit, &c. Examples will be found in this class of art in its own department, under the general heads of Pottery and Ceramic Art, and Ornamental Plate. It would be impossible here to enter into a detailed examination of the numerous interesting specimens contributed by well-known establishments in these important branches of what may be termed industrial or applied sculpture, though it may come within the scope of our functions to particularise some of the leading firms who are conspicuous exhibitors in this class.

Among the works in sculpture which, by right of merit and subject, will come under the first head of the above classification is one that will attract attention from some peculiarities in its technical treatment. This is the introduction of polychromy in sculpture; and it is on this account that it is here selected for especial comment. It is a group in marble of a woman and child, by our eminent countryman, the late John Gibson, and is a good example of that admired sculptor's talent. The forms are carefully studied, the drapery is composed effectively and in harmony with the move-

ment of the figure, while the execution exhibits the well-known power of the accomplished artist. But the accompaniments given to this performance, of blue eyes, tinted hair, and flesh colour (or what is or was intended for it) in the naked parts, with gilding in other portions, almost removes it from the category of pure sculpture, and may be said to convert it into an example of decorative art. It has been said that the use of colour in sculpture is merely a question of taste. Not so. It may confidently be argued that if the true function of sculpture is to represent by form only, such productions as the one under consideration challenge criticism on false and mixed grounds; that is, as both sculpture and painting. But the warmest admirer of flesh-tinting marble statues would, scarcely, it may be presumed, consent to subject the process to the test of criticism as painting; and this seems to dispose of the matter as a question of fine art. Our worthy countryman based his practice in this particular innovation on the assumed authority of the ancients; but the fact—which, however, must be admitted with considerable qualification—that in some instances the Greeks employed, in their sculpture, accessories, as paint (and then always in thick body-colour) and other materials, affords no sufficient argument for their use by modern sculptors, either as a justifiable practice or as a means of improving sculpture.*

So in another branch of practice, before alluded to, where the *picturesque* is too prominently sought after. Here it often happens that the forms are rather implied than defined. In these cases of sketchy and indistinct execution, a true art condition is departed from, and is not to be justified, however dashing and bold the treatment may be. In works so represented it is not *form* that is given, but only a more or less vague indication of it. It is a maxim, already adverted to, that in fine art the forms selected should be good, and, of their kind, beautiful; and it is for this reason that the finest ancient sculpture, which always shows the submission of its authors to this principle, holds its empire in the opinions of all persons competent to judge on such questions. The attempt to treat an art of form in a slovenly, undefined way, for the purpose of producing picturesque effects for which it is not calculated, is not only a most dangerous—and it may be said illogical practice—for, strictly speaking, undefined form cannot be accepted as form, in a sculptural sense—but it tends to lower the character of sculpture (which in the best ages had the *prestige* of a chaste and somewhat severe art) to a species of claptrap, prepared to excite the surprise and applause of uncultivated minds. Moreover—and this fact should always be remembered—wherever it has been attempted it has uniformly resulted in the decadence of the art. Even the genius of Bernini, of Giovanni di Bologna, and of Rouilliac, who were the greatest leaders of the picturesque movement in sculpture, could not save the art from its inevitable fall—the sure and fatal consequence of their corrupt system of "bravura" and dashing effect of execution. But even here due credit must be given to those able artists for one redeeming particular of their practice; and this was the care they gave to the defined and accurate representation of the objects they imitated. Their works exhibit no examples of slighted forms. However objectionable the taste which ruled the design, all the details were presented under the required conditions of the most careful attention and finish.

In commencing with the British department it is gratifying to find that H.R.H. the Princess Louise shows her interest in art by contributing a statuette to the Exhibition.

Among the more prominent works in marble, attention will be attracted to some of great merit by Messrs. C. Marshall, Durham, Stephens, Bell, Birch, Leifchild, J. Westmacott, the Woods (W. and M.), and Wyon, who, exhibiting various subjects requiring reflection for their due expression, have presented them in well-studied forms, and with the recommendation of careful execution. If the limits to which this paper is confined allowed of a more extended notice, other artists, as Crittenden, Davis, Earle, Theed, Sharp, and two lady sculptors, Mrs. Thornycroft and Miss Durant, might be mentioned as contributing works of various degrees of merit in marble and models in plaster. The omission of other names and works from this notice must not be attributed always to their want of merit, but to the necessity of condensing as much as possible a report which does not profess to include any detailed criticism of (fine art) sculpture.

Italy has contributed some works of very superior merit; by (the late) Finelli, by Caroni, who has several excellent productions, by Salvini, and by

* From the Official Report.

* This must be taken as the individual opinion of an eminent artist.—Ed.

Tantardini. Their statuary in the Italian gallery deserves notice for its truth and careful execution. The last-named artist exhibits several statues of the *genre* or costume class, which for the study of characteristic details, and especially for the skilful manipulation of the marble, are, of their kind, highly meritorious productions—praise which may justly be extended to many others of the foreign sculptors here met with, as well as to those whose works are distributed in various parts of the building, as Amiei, Barzaghi, Fantaecchiotti, Chelli, Fontana, Lazzarini, and Torelli. In the productions of this school, even when exceptions may be taken to the subjects selected for imitation, there is indication of sound and careful elementary training in the study of form which might be usefully adopted elsewhere. Indeed, the art of the chief foreign schools may be said generally to exhibit marked superiority in this important particular. Where the works may seem to fail in other respects, there usually is evidence of a thorough knowledge of form—or what is understood, in the language of art, as “drawing”—from which it may be inferred that correct design is, as it always should be, a subject of most careful attention in the education of the student.

Belgium is well represented in the works contributed by her sculptors. Among these are Messrs. Geefs, De Leemans, Fraikin, Fassin, Van Oemberg, Rombaux, Du Caju, and Sopers, whose various productions, some of very high merit, would receive here a more extended examination but for the reasons previously adverted to. Little more can be done than mention the names of the most distinguished contributors, trusting that here, as elsewhere, even so slight a reference will lead the visitor to give the works the careful attention they deserve. There are many works by sculptors having German names, but whose places of birth or residence are not stated in the lists to which the writer of this notice has had access. These artists are therefore requested to make allowance for any errors that may appear in classifying them. Many works referable to German sculptors are placed in the British department, and the attention of the visitor who takes an interest in this art will be arrested by some productions of striking merit coming from that country, as well as from neighbouring localities. Among these should be noticed especially the works of Voss, Junck, Jerichau, (of Copenhagen), Raemaekers, Van Denbosch, and Boehm. The style of this last sculptor may generally be referred to the realistic and picturesque school. His works exhibit great merit, and his busts in *terra-cotta* are carefully modelled, full of character and true to Nature.

French sculpture is not adequately represented in this exhibition, but the visitor will observe much to admire in the contributions of MM. Clesinger, Carlier, Gruyère, and others, in bronze and in marble. Some statues and two large busts, in various materials (bronze and coloured marbles), by Cordier, have great merit, but, like all similar productions, they seem to belong to the department of decorative rather than Fine Art.

Although no lengthened description can be given of particular works, the visitor's attention should be directed to the very interesting collection of pottery and ceramic art, and to some good specimens of applied art in ornamental plate. It is very important that these works should here receive marked notice, as they exhibit in the application of a good style of design to their several specialties the great progress that has been made in industrial art of late years. The contributions of Messrs. Minton, Copeland, and Wedgwood; of the Royal Berlin Porcelain Works; others from the Worcester Works; from the Royal Porcelain Works at Copenhagen; from Messrs. Bing & Grøndahl; from Gustafsbergs Co. (Sweden), and others, will amply repay the attention the visitor may bestow on them; while the productions of the English firms of Messrs. Hancock, Garrard, Elkington, and some few but good specimens from France, exhibit most satisfactory proofs in the industrial products of their respective profession of their successful practice of the various phases of art.

It would be wrong in a report in which it is desired reference should be especially made to the employment of sculpture to useful and ornamental works, not to take notice of some good wood carving that may be found in the furniture department of the Exhibition. Distinct reference should also be made to the extensive use now prevalent of *terra-cotta* in architectural decoration. There are some very creditable works of fine art sculpture in this material, but it is in its application to useful or decorative purposes that its importance is to be recognised in this place. The great and successful use of *terra-cotta* to be seen in the enrichment of the columns and other parts of the new buildings at the South Kensington Museum, in the Royal Horticultural Gardens, and elsewhere, proves how valu-

able this application of art may become. There are some very good productions in this material by Boni (Italy), as well as by French artists; by the Crystal Palace Ceramic Art Union, and other well-known establishments. Among these may be especially distinguished the several firms of MM. Blashfield, Blanchard, and Doulton & Co. In thus referring to these houses it is only an act of justice to bear witness to the great improvements that have been effected by them in bringing *terra-cotta* into more general use. The most satisfactory results have been secured in modifying the more striking defects caused by the shrinking of the clay under the processes of drying and, subsequently, the strong action of heat in firing. The ill-finished work of former days often, nay, usually, showed broken lines, irregular joining in masonry, and unworkmanlike execution. There are examples now on exhibition, reproductions of really good sculpture, which show that these difficulties—and therefore the objections to the employment of *terra-cotta* (except for the commonest objects) are almost if not entirely overcome. This is a most important achievement, when the durability and, compared with marble or stone, the cheapness of the material are taken into consideration. The opportunity is now presented of obtaining every variety of effective decoration, for architectural and similar purposes, at a cost within very modest means. Without pretending to place *terra-cotta* works on an equality with highly-studied and refined original ornamental (carved) sculpture, it must still be admitted to be a most valuable substitute for it; and, as its employment is now being extensively adopted by architects, this reference to the progress made in adapting it to their requirements for mouldings, cornices, friezes, keystones, and similar works, cannot be considered out of place.

The artistic quality exhibited in what may be classed as industrial works, including furniture, or where gold and silver work, carving, bronze castings—in figures and groups for ornamental plate—clocks, lamps, sideboards, and cabinets are introduced, and in which both taste in design and skilful execution may be found, will, of course be considered in the reports to be furnished in their several departments. While, however, the consideration of details may be safely left to the competent examiners to whom this duty has been assigned, it may not be irrelevant to remark here on the general character of the art now seen in such productions, compared with that shown in similar works of half a century ago; and it is gratifying to be able to bear witness to the fact of the great improvement that is exhibited. This phrase applies to the style of their ornamentation, to the variety of subjects illustrated, to the choice of form, and to the greater freedom and breadth of treatment observable in execution. Now there can be no doubt, and too much stress cannot be laid on this fact, that all this progress may fairly be attributed to the influence exercised by the higher forms of art having been more carefully studied. A class of artists has thus been formed who, when they may not have been successful in achieving all that their earlier ambition led them to aspire to, have, as educated artists, lent their talents to improve art, in what may, it is true, be considered a subordinate branch of practice, but which is not the less worthy of care, inasmuch as its effects, in an educational point of view, are distributed over a larger surface.

In concluding this summary it is right to mention that since its completion many additions have been made to the sculpture contributed to this Exhibition, especially in works by foreign artists. Their late arrival has prevented their being noticed as, in many cases, their merits deserve. It is also a matter of regret to the writer that he has felt himself precluded from entering more extensively and critically into the examination of many individual works of merit in sculpture; but neither the space at his disposal nor the restricted object to which he has felt himself confined has permitted this. It must be borne in mind that this report does not put forth any pretensions to be considered an essay—critical or theoretical—on fine art. It simply reviews the present condition of one branch of art in its relation to, and influence on, those industrial products in which the employment or reproduction of form of all kinds constitutes the leading element.

The application of improved taste and methods in industrial design has opened in recent years a large and very important field of practice; for where only a very few persons have a real love of, or are gifted with natural taste for fine art, and are competent to judge it correctly, or who, having these rare qualifications, possess the means of acquiring fine examples of sculpture, there are thousands whose sense of the beautiful may be advanced or

even created, by seeing around them, in the ordinary objects of daily and familiar use, pleasing forms and combinations, and skilful and delicate workmanship, which may both educate their powers of observation, improve their taste, and add immensely to their enjoyment. Nor can it be supposed the good effect of this education or development of the sense of seeing—and this is an art in itself—stops here. Even from the material point of view, the cultivation of a love of art, in its teachings of the charms and value of the beautiful, has recommendations which will be admitted by every intelligent and unprejudiced mind. But beyond this, without laying undue stress on the beneficial effects to be expected from the study of art, or indulging in romantic ideas or speculation on its power to refine and improve human nature, it may still be presumed that the exercise and education of the faculties in endeavouring to ascertain what constitutes beauty—that subtle quality or attribute which may be found, by those who know how to look for it, under different forms and aspects, in all created things—may bear fruits infinitely beyond our immediate cognisance. Is it too much to say that the whole moral feeling of society ought to be and may be elevated by the lessons thus taught, and that from the power or aptitude thus imparted to it to appreciate beauty in material things, the mind may learn to seek it in a still wider and nobler field—in sentiment and in action—and thus acquire the habit of associating the idea of the beautiful and the good in all the relations of life?

TECHNICAL EDUCATION IN RUSSIA.

THE great success which attended the Exhibition of National Industry held at S. Petersburg last year, and the increasing requirements felt for promoting technical knowledge of all kinds, have led to a plan for holding a Polytechnical Exhibition at Moscow in the summer of next year, which will be devoted principally to mechanical processes conducted on the spot. One of the principal features of this exhibition will be that each important section will be contained in a separate building, so as to afford facilities for arranging the exhibits according to the special requirements of each department. Munitions of war will be exhibited; the principal building devoted to this section of the exhibition will be erected within the precincts of the Kremlin, and will, according to a writer in the *Engineer*, be of a somewhat special character. In form it will be semicircular, and in size about 280ft. in diameter, with the interior divided into sections by semicircular passages running parallel to each other, containing exhibits displayed by the various departments of the War Ministry. These semicircular passages will be intersected by others radiating from the centre. The whole of the edifice is to be constructed of iron and glass, with the exception of a little ornamentation in wood in the Russian style. The building devoted to exhibits by the Ministry of Marine will occupy a space almost double that of the military department, and will also be constructed of iron and glass, with wood ornamentation in the Russian style. The iron-work of these structures is to be altogether of a novel kind. The whole of the skeleton of the building will be formed of old rails, according to a system invented by M. Pouillof, the iron manufacturer, who has already applied this principle in connection with some of his works. The Museum of Marine will contain three rectangular pavilions, of which the middle one will be the largest, all decorated in the Russian style of bright gilding.

A short time back was published the report of the Technical Society of Russia for the year ending 1870, from which it appears that the greatest success has attended that part of the programme of the association which dealt with lectures on technical subjects. There were altogether 107 sittings during the year. But the apparently most useful object of the society, the forming of primary technical schools for the poorer classes, has met with but slender support, and so has the endeavour to establish evening classes for factory hands, men and children principally owing to their utter exhaustion from the twelve to fourteen hours' labour daily required of them. Some success is reported in the way of technical publications for the use of artisans, mechanics, &c. One of the objects of the society is the establishing of industrial museums. A plan has already been sanctioned for forming a permanent museum of applied science at S. Petersburg, in the edifice in which the industrial exhibition was held last year.

A new school of science and art has been erected at Birkenhead, at the expense of Mr. Laird, M.P., Messrs. H. and J. Hay, of Liverpool, being the architects.

FIRE-PROOF FLOORS.

A NEW method of rendering floors fire-proof has been patented by James Dunseith, of New York, who, according to an American contemporary, employs long flat bars of thin sheet metal, with a perpendicular flange turned on each edge. Other long thin bars, which are curved or arched, and riveted at or near their edges to the first named strips, are placed edgewise vertically, one between each two, the connection being so arranged that the tops of the arches do not rise quite as high as the tops of the first set of bars. Narrower strips are also arranged across and riveted to the lower flanges at suitable intervals apart, to serve as laths for holding the ceiling plastering to be applied to them as well as to brace them laterally. Other similar strips are arranged across and riveted to the upper flanges, or wood pieces may be bolted on, if desired, to receive and support the floor boards. The outside flanges are built into and rest in the wall. Other flanges may be applied, if desired, to the outside strip for letting into the wall. For a floor of great length the bars are lapped and riveted. The width may be regulated by the number of bars connected together. Diagonal braces may be employed if preferred. The width of the bars is varied to suit the circumstances of the case, but for ordinary floors the inventor proposes to make them from about ten to fourteen inches, and believes that, with bars of this width, stronger floors can be made with a given weight of material than can be made by any other arrangement. He sometimes prefers to brace the arched plates by angle wire bars bent over and riveted to them.

THE NATURAL HISTORY OF PAVING STONES.*

(Continued from p. 211.)

YOU observe that we have here a sloping plain. Now this plain consists chiefly of stratified rocks of various kinds. But you notice that Penmaenmawr is a huge rocky mass that rises up out of the plains—a huge boss. Now let us see the other side of Penmaenmawr. When viewed from the opposite side, it presents precisely the same features as before. Here you have Penmaenmawr as seen from the village itself. You observe that from this side you again have a large plain, made up of stratified rocks, with this immense boss of lava that has been forced through from below. The section I am about to show you is from the very heart of a mountain called Mynyddmaior. It consists of substantially the same rocks as Penmaenmawr. Now notice the stratified rocks. They have been thrown into almost vertical positions by the outburst of this lava. When the denuding currents have swept over that country—as I have told you they have done, again and again through countless ages—they have removed all those portions of the rocks that were softer than others; they have yielded to the action of the water, whilst the harder rocks have resisted it. Now this lava being harder than the stratified rocks, has resisted that action; and, therefore, it stands out like a huge boss from the surrounding plain, precisely in the same way that we have seen that Penmaenmawr stands out from the plain surrounding it. It is simply because this crystalline lava is very much harder than the rocks around it that it stands in this fashion; it has resisted the denuding action; the other rocks have yielded to that action. Here, then, we have a clear illustration of the nature of the rock of which Penmaenmawr consists, and which we are using to a very considerable extent for the purpose of paving the streets of Manchester. We will now leave Penmaenmawr.

Let us next see what we have in the Brown Clec Hills. Mr. Stott informs me that the Clec Hills stone will serve our purpose better than the Penmaenmawr stone. He believes it to be a harder stone. But when we examine the conditions under which it was formed we discover that it is substantially the same thing we have had before. Here you have a section of the Clec Hills. At the base we have a limestone, similar to that which you have in the hilly districts of Derbyshire. Then we have here the millstone grit—that coarse grit—stone found in the hills behind Oldham and Rochdale. Then, at the upper part, we have a coal field, furnished with seams of coal like those that we find in this neighbourhood. But this red band running up through the centre of the section, and overflowing right and left, is really lava, very similar to what we have seen at Penmaenmawr, a crystalline basalt, which is spread out over a very considerable area, forming an

extensive moorland district; and it is from this district that this Clec Hill basalt is now being brought to Manchester. Thus we see that the phenomena attending the formation of this Clec Hill basalt are precisely the same in all essential features as those that have attended the formation of the basalts in Wales.

We have now to look at the third stone. You are all more or less familiar with the name of granite. Granite has unquestionably been an ancient lava; but it has been rather different from modern lavas in a variety of secondary circumstances. We see very clearly, first from its composition, and second from its microscopic structure, that it has not been formed under the same conditions as the ancient lavas with which we are familiar. The probability is that it has been formed under greater pressure. Whether that pressure has taken place deep in the interior of the earth, or whether it has taken place, as some suppose, under a deep ocean, we have no means of knowing. But there are many minor and secondary features about it which indicate that the conditions which make granite different from other stones have resulted from an enormous pressure. But then we have two kinds of granite. Common granite is made up of three minerals, known by the respective names of quartz, mica, and felspar. But the particular variety which I hold in my hand is that known by the name of syenite; and it differs from other granite inasmuch as the mica of ordinary granite is replaced by the crystals called hornblende. This is not a matter of any very great consequence to us, except for this reason, that the hornblende being somewhat harder than mica, we may fairly expect that the syenite may give us a harder paving stone than the ordinary granite. We will see what this syenite is like when at home. Here is a section which exhibits to us the locality from which this syenite is obtained. In it we again observe that we have the stratified rocks thrown upon end. The fact is, these stratified rocks in Wales, as elsewhere, have been twisted and twined about almost as easily as you could twist and twine about layers of cloth or brown paper. The forces with which Nature has altered the condition of these strata have been so gigantic that any resistance these rocks could afford has amounted to very little indeed. This syenite, you observe, presents itself to us under precisely similar conditions to those we have seen in the case of basalt. It comes up from below, filling a huge crack; and if we examine the sides of the crack we shall discover that the heat of the fluid mass of syenite has altered the rocks just as the basalts and other lavas altered the stratified rocks.

We will now leave these "sets," and examine an altogether different branch of our subject. We must turn to the ancient Manchester paving, and this brings us to the boulder stones. We have to take into consideration two or three circumstances in connection with these boulder stones. I am informed by Mr. Scott that in the olden time, when we were in the habit of importing boulder stones for all the streets of Manchester, they were chiefly brought from the sea coast of Cumberland. If you go to the sea coast, either of Cumberland or any other land, you will find that it is frequently made up of rounded stones, anything but agreeable to walk upon; almost worse, if possible, than the rounded stones with which your older streets are paved. You might be disposed to imagine that all these rounded boulder stones had tumbled down from the cliffs above, and simply been rounded by the action of the water, by the waves beating upon them year after year and century after century. And in the case of many of these boulders you would undoubtedly be right in so surmising. I don't know much about the Cumberland coast, but I could take you to the Yorkshire coast, about which I do know something, and could show you there precisely similar phenomena to those which appear on the Cumberland coast; and we have every reason to suppose that the essential conditions are pretty much the same in the two localities. When we visit these coasts, whilst we discover a large number of rounded stones derived from rocks forming the adjacent cliffs, we also discover mixed up with them a very large number of stones that are not to be found *in situ*, as we call it, that is in their natural position, within miles from us. Here, then, we clearly have to seek out some agent that has assisted the sea. There has evidently been some other power at work that has brought boulder stones to that Cumberland coast that were not there originally, and that were not derived from the strata of the adjoining cliffs. We find there granites and lavas, and an endless variety of other rocks that were not originally derived from the Cumberland hills at all; they have been imported into that district, and subsequently re-imported from that district to Manchester. Now whence have these other stones come? It will

simplify the matter, as the Irish song says, "altogether entirely," if we call your attention to a Manchester brick-field. You may ask, what on earth can a Manchester brickfield have to do with Cumberland boulders and the paving of Manchester streets? More than you would imagine at first sight. If I take a walk with you to a Manchester brick-field, we shall discover that we are most interested in precisely that part of the field that will be the greatest abomination to the brickmaker. The brickmaker likes the nice, smooth, soft clay, without any stones in it, which to the geologist is about as stupid a part of the field as he could have. The geologist, on the other hand, likes to find a place that is full of gravel and sand, and huge boulder stones of every shape, and sort, and size—the very abomination of the brickmaker. I have here certain boulder stones that were taken from a Manchester brick-field. What have I in my hand? A block of granite, which I carried painfully and laboriously one day from a brick-field in the neighbourhood of Ladybarn. It is a mass of granite, rounded just like the rocks on the Cumberland coast. That granite has been transported from a considerable distance, because we have no granites nearer than Cumberland. The nearest granite we have to this locality is that we have at Shap Fell in Cumberland. The granite from Shap Fell is a very remarkable granite, from the large crystals of flesh colour which distinguish it. I have here, from this same brick-yard, a piece of Shap Fell granite. Why, I could swear to this piece of granite all the world over, as a man would swear to the face of his own wife, wherever he met with her. The features of it are so remarkable that you could not mistake it, if you knew what Shap Fell granite was. Now this Shap Fell granite, rounded and water-worn, has been brought to a Manchester brick-yard. How has it got there? I have here another boulder. There is nothing particular about the appearance of this boulder, except that it is a piece of limestone that never "grow'd"—if I may apply Topsy's word—in the neighbourhood of Manchester. It, like these other stones, has been brought to Manchester from a distance, but it tells me another story. It has another tale to record. I see that this surface is grooved, as if covered with the marks of a file. I turn it round to the other side, and I see that it is filed and grooved in like manner; but these grooves are not parallel with the former grooves. Here is a second flat face. It is very evident that in some way both these faces have had a good scrubbing, that has evolved something more than a mere washing of the face. I dare say we have some keen reminiscences of the sort of scrubbing we used to get from the nurse's hands with rough coarse towels; but that is nothing compared with the scrubbing these stones must have had. There has been an action which has flattened that surface and grooved it at the same time. We want some agency that will do all these things together. You will remember that when my friend Professor Huxley lectured here at the beginning of this series of lectures, he pointed out to you in a very clear and prominent manner, how absolutely necessary it was that any theory that was propounded to explain a multitude of phenomena should "go upon all fours;" that is, it must be equal to the explanation of all the several isolated and detached facts that the theory is intended to explain.

(To be concluded.)

THE NEW CORPORATION LIBRARY.—A small piece of ground at the back of the Bankruptcy Court being required for the reception-room of the new library, it has been purchased by the Corporation from Government for £1,000. As the superficial area of the ground is 107ft. 8in., this is at the rate of nearly £10 per foot.

A RUNAWAY ROAD ROLLER.—The accident in Pall Mall last week should have the effect of rendering men in charge of steam road-rollers more careful. A machine capable of doing almost any amount of damage should not be left in a London street to the mercy of any juvenile idiot. On Thursday week a large steam-roller, belonging to Messrs. Mowlem, Burt, & Freeman, was left standing in front of the Pall-mall Restaurant while the driver went to dinner. One of a party of mischievous boys congregated near the spot, mounted the engine, and in some manner started it. Alarmed at the consequence of his foolishness, he jumped off, and was lost in the crowd which, seeing the accident, had rapidly assembled. The huge machine moved irregularly along the thoroughfare; ultimately, with increasing velocity, it darted into the shop front of a photographic colourist, in Cockspur-street, completely smashing the stonework and façade. Several persons were more or less seriously injured, and one or two nearly killed.

* By PROFESSOR WILLIAMSON, F.R.S. From "Science Lectures for the People."

NEW LAW COURTS, JUDGES' LODGINGS, & MUNICIPAL BUILDINGS, BIRMINGHAM.

ONE of our principal illustrations represents a design submitted in competition for the above buildings, the elevation being towards Ann-street, with a plan of the principal floor.

As the present Town Hall is a Classic pedimented building, of heavy proportions and well situated, adjoining to which it is proposed to erect these buildings it was imperative in designing an elevation for this site, to give height and dignity to form a pleasing contrast. For that object they have been kept well out of the ground, the stories being of good dimensions, and a large tower arranged in the centre, added to which one of smaller size is placed in Congreve-street at the intersection of the Municipal Buildings with the Law Courts, with that idea, and one for combining the three buildings into one harmonious group. This mode of treatment was considered the most effectual for the purpose in view. The illustration is the elevation of the municipal portion of the structure and the front view of the judges' lodgings, which are kept apart, and are of a more domestic character than the civic portion.

The plan will show the internal arrangements better than could be briefly described here; suffice it to say that the reception-hall, council-chamber, and two courts are placed central, to be free from street noises, and surrounded by their offices, &c. The entrance waiting-hall, staircases, and principal corridors are groined with stone ribs, the spandrels being filled in with the Dennett arch. The rooms on this floor facing Ann-street are devoted to committee-rooms; the mayor and town clerk are likewise on this level. The entrance to the law courts, which is 22ft. 6in. wide and groined, is from Congreve-street, and up three flights of steps to the level of the courts, which are fifteen feet above the street, and from which the public hall is entered, from whence the courts and offices are reached, with corridors communicating to the various offices. The judges' lodgings are also on the same level. The whole of the buildings (exclusive of towers) contain 3,089,015 cubic feet, and the cost will be £120,000.

The author of the design is Mr. Alfred Langston, of London, who responded to the call of the corporation by furnishing them with a scheme that is well-arranged, well-lighted, practical, and artistic, besides having closely adhered to the instructions issued to architects.

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Female witnesses' rooms.....	24		
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TRAMWAYS FOR GLASGOW.

ON Friday last the ground was formally broken for the commencement of the construction of the Glasgow tramways. The extent of mileage embraced in the scheme is seventeen miles, of which nine and a half will be of double-line tramways of the first class, at an estimated cost of £9,000 per mile. Only the works of the principal thoroughfares, says the *Glasgow Evening Citizen*, are, however, meanwhile contracted for. The following is an outline of the mode of construction:—After earth has been removed to the depth of about sixteen inches, a four-inch layer of bituminous concrete is spread over the soil, on which composition cross-sleepers are laid of creosoted red Baltic timber, to these chairs are spiked, which receive longitudinal

beams of American oak, fastened by oaken tree nails driven through the flanges of the chairs. These beams are covered by the rails (weight 60lbs. per lineal yard), then a second coating of concrete is laid to a little above the level of the sleepers, and this is covered by a layer of sand. The paving stones are jointed with bitumen for three inches on each side of the beams and rails, the timber being thus fitted into a sort of air-tight case. The contractors for the rails, &c., are Messrs. Charles Brand & Son, of Cumnock, and for the paving, Messrs. Faill, of Glasgow. The rails will be made by the Rhymney Iron Company, of Wales. The engineers are Messrs. Johnston & Rankine, and Mr. Carrick, Master-of-Works and City architect.

The omnibuses by which the tramways are to be traversed are to be constructed to carry twenty-two passengers inside, and about as many out. The steps giving access are to be only six inches from the ground. Each omnibus will be drawn by not more than two horses, and on routes on which, at present, the service is only once every half-hour an omnibus will run every ten minutes. (Just now on the Argyle-street thoroughfare an omnibus leaves each end almost every minute.) The maximum fare, as fixed by statute, is one penny per mile, outside or in; and the company is under an obligation to run on each line, morning and evening, two omnibuses for workpeople at fares not exceeding one halfpenny per mile. This company—"limited," with a minimum capital of £200,000—has leased the tramways from the Corporation for twenty years, in return for a certain rent in the form of interest, and an obligation on the part of the company to maintain in good repair the portion of the streets which they occupy. On the expiration of the lease the tramways are to be returned to the proprietary in good working order, the lessees refunding the money originally expended in their formation.

NEW LUNATIC ASYLUM FOR THE EAST RIDING, NEAR BEVERLEY, YORKSHIRE.

IN the course of a few days the Broadgate Lunatic Asylum, near Beverley, will be opened for the reception of patients. The erection of the building was determined upon two or three years ago, when plans were invited, and Mr. C. H. Howell and Mr. H. Kendall, both of London, architects, submitted one each, that of Mr. Howell being finally approved and adopted by the Committee of Justices who were appointed to carry out the work. Tenders for the erection of the building were received in December, 1868, and that of Mr. W. Bellerby, of York, being the lowest (£23,725) was accepted, and the work was commenced in April, 1869. The gas-works, lodges, cottages, farm buildings, &c., have since been contracted for, and these will increase the cost by £4,000 or £5,000. The total cost of the asylum and its accessory buildings, including fittings, the furniture, and the purchase of the site, will be about £40,000. The asylum itself is in the Italian style, and covers an area of about 13,500 square yards of land. It is built of red stock brick, relieved with white brick and stone dressings. It possesses two fronts, facing respectively north and south, their length being about 400ft. each. The breadth of the building is nearly 300ft. The principal front is towards the south, but that on the north contains the entrances, it being the one nearest approached from the main road. At the west angle of the north front is the superintendent's house, which communicates with the main building by a circular corridor, and at the east angle of the same front is the chapel. There are two airing courts for men, and two for women, which contain about 7,350 square yards each, and in the centre of the south front is a circular court, containing about 4,030 square yards, in which will be erected a bandstand, for the use of the musicians connected with the establishment. The asylum is capable of accommodating 300 patients and attendants. Although the principal front of the building, as before stated, faces the south, the entrance for all ordinary purposes will be from the north side. On the right of the main doorway in this front is the reception-room; on the left is the visiting committee's room. Further on to the extreme right and left of this north front are the bath-rooms, each containing two baths supplied with hot and cold water. Adjoining the bath-rooms, and communicating with them, are the lavatories, which are fitted up with Macfarlane's patent basins and taps. On the ground floor are also the day-rooms, which are lofty and capacious. The largest of the male and female day-rooms are made to accommodate 60 patients each. From the men's day-room is an approach to the chapel, which forms the east wing of the north front, and is roofed with green Westmoreland slates, whereas the whole

of the other parts of the asylum are covered with Welsh slates, which have a purple cast. The chapel will accommodate nearly 200 persons. Long wide corridors conduct to other departments on the ground floor, amongst which are shoemakers', matmakers', and tailors' workrooms, the surgery, and the steward's store-room. In the centre of the asylum buildings is the kitchen, a lofty apartment lighted from the top, and fitted with Benham's patent cooking range. Near to the kitchen is the larder, below which are cool cellars to be used for dairy purposes. The kitchen looks into the dining-hall, which will accommodate 160 persons. In this hall are recesses for side-tables for the convenience of serving, &c. The food will be passed from the kitchen into the dining-rooms through windows connecting the two rooms, the sills of which are made for the purpose. There are similar windows into the corridors, through which will be handed food to be conveyed to the sick and infirm wards. The laundry is on the ground floor. The only dormitories on the ground floor are those for the epileptic and paralytic patients, and those in the infirmary wards, the latter being day-rooms and dormitories combined, in connection with which are small sitting-rooms for the convalescent. There is accommodation for twenty patients each in the male and female infirmary wards. The matron's store-room is also on the ground floor. The ordinary dormitories are on the first and second floors. The largest women's dormitory contains 28 beds, and the largest men's 22 beds, the other dormitories being of various sizes. There are also 66 bed-rooms, containing one bed each, and these will be reserved for a certain class of patients, whose affliction renders isolation necessary. The attendants' rooms adjoin the large dormitories, and from his or her apartment the attendant has a view into two of these sleeping-rooms. The light will be thrown into the large dormitories by means of reflectors placed behind gas-burners fixed in the attendants' rooms. About 1,000 cubic feet is allowed for each person in the dormitories, and the ventilation is thorough. Above the infirmary wards are wards for feeble patients, and on the first floor are also workrooms for convalescents, both male and female. The building is provided with a complete system of dust and air passages, Macfarlane's patent dust-shafts being used, and the dust is carried by their aid to one focus. For the general ventilation of the building two towers have been erected for carrying off the rarefied air. All the windows are made to open only 5in. or 6in.

The chief outbuildings are the gasworks and engine-shops (on the south-west of the main building), the workshops for joiners, blacksmiths, painters, &c. (on the east-side), and the post-mortem houses. In course of construction, near to the gasworks, are the farm buildings, which comprise, in addition to the ordinary requirements of a farmstead, a pinning-house, slaughter-house, &c. To the south-west of the farm buildings a house will be erected for the use of the farm bailiff.

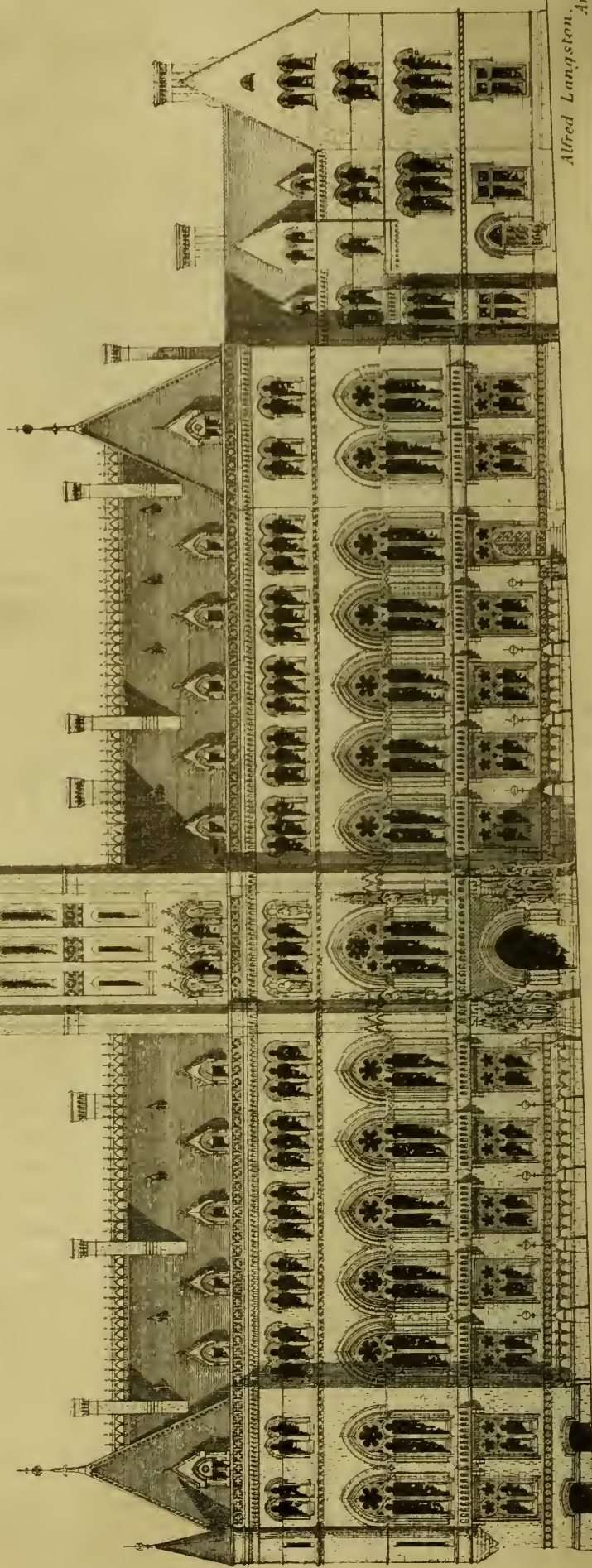
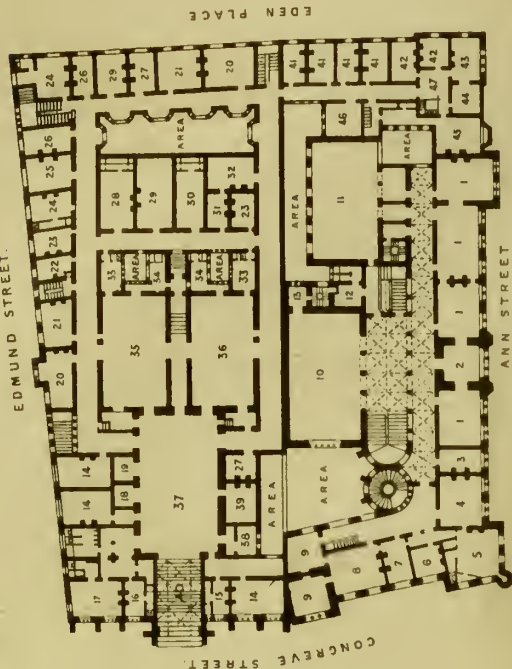
The contractor for the building, as before stated, was Mr. W. Bellerby, of York. The sub-contractors were as follows:—Bricklayer, Mr. Biscoombe, York; stonemason, Mr. Bailey, York; plumber, Mr. Walsh, Halifax; slater, Mr. Baiues, Ripon; engineers, Messrs. Thompson & Stather, Hull; gas engineers, Messrs. Porter & Co., Lincoln. The work has been carried out under the supervision of Mr. W. Lewis, architect and surveyor, York, who has acted as clerk of the works under the architect, Mr. C. H. Howell, of London.

COLLEGE FOR THE DAUGHTERS OF CONGREGATIONAL MINISTERS, GRAVESEND.

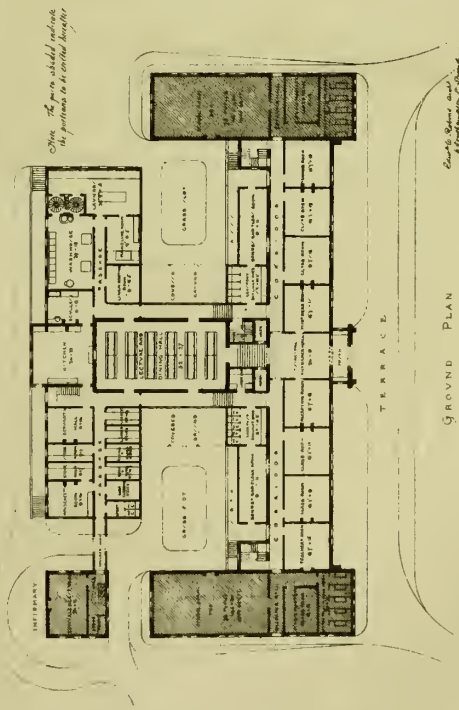
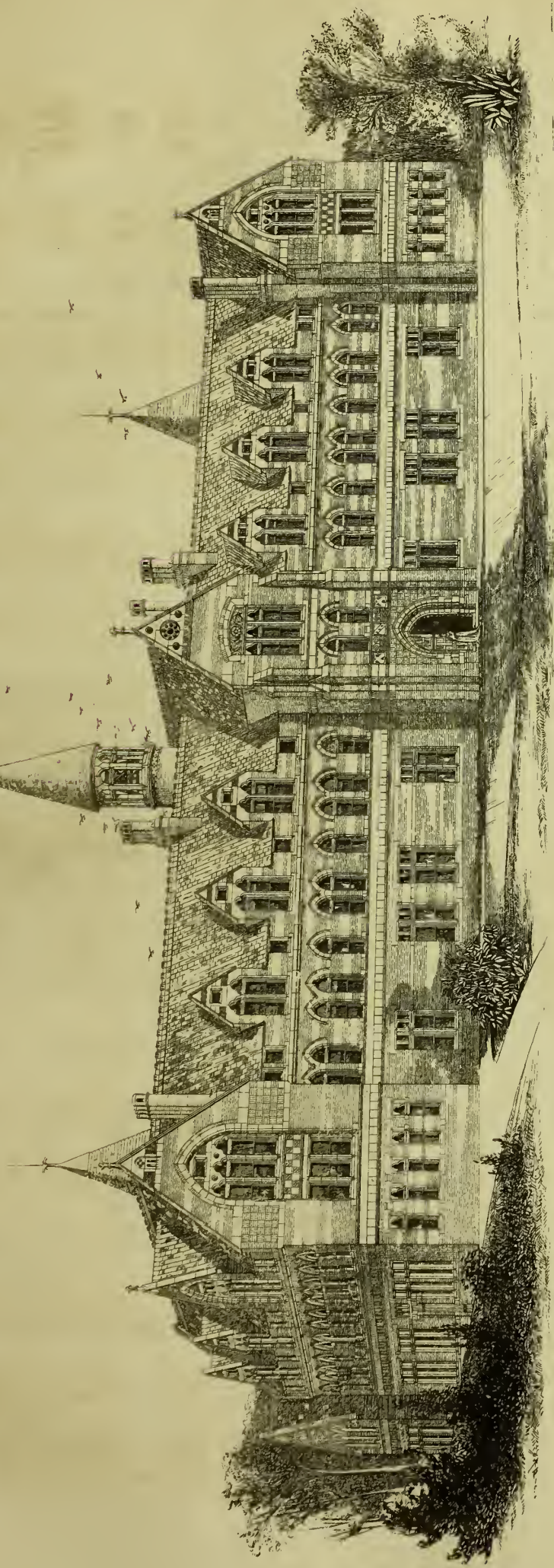
THE above institution, originated by the Rev. William Guest, of Gravesend, is ultimately intended for the board, residence, and education of 150 young ladies. The site chosen is elevated ground at Milton, near the reservoir adjoining Windmill-hill. The designs of Mr. E. C. Robins, of London, were recently selected in limited competition. Our illustration gives the approved plans and the south-eastern view of the proposed building as it will appear when completed. The parts shaded on the plans will not be included in the first contract, as it is not intended to provide for more than 84 pupils in the main building in the first instance, but the dining and lecture-hall, domestic offices, and laundry are arranged for the accommodation of 150 pupils. The school-room will be situated on the space occupied by the three class-rooms on the left side of the central portion, the division walls shown being omitted. The foundation-stone will be laid by Mr. Morley on the 5th of October.



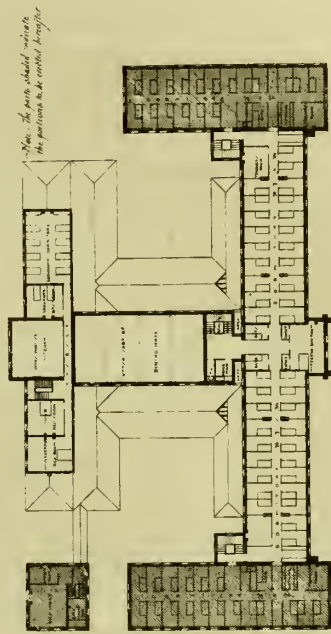
PRINCIPAL FLOOR PLAN



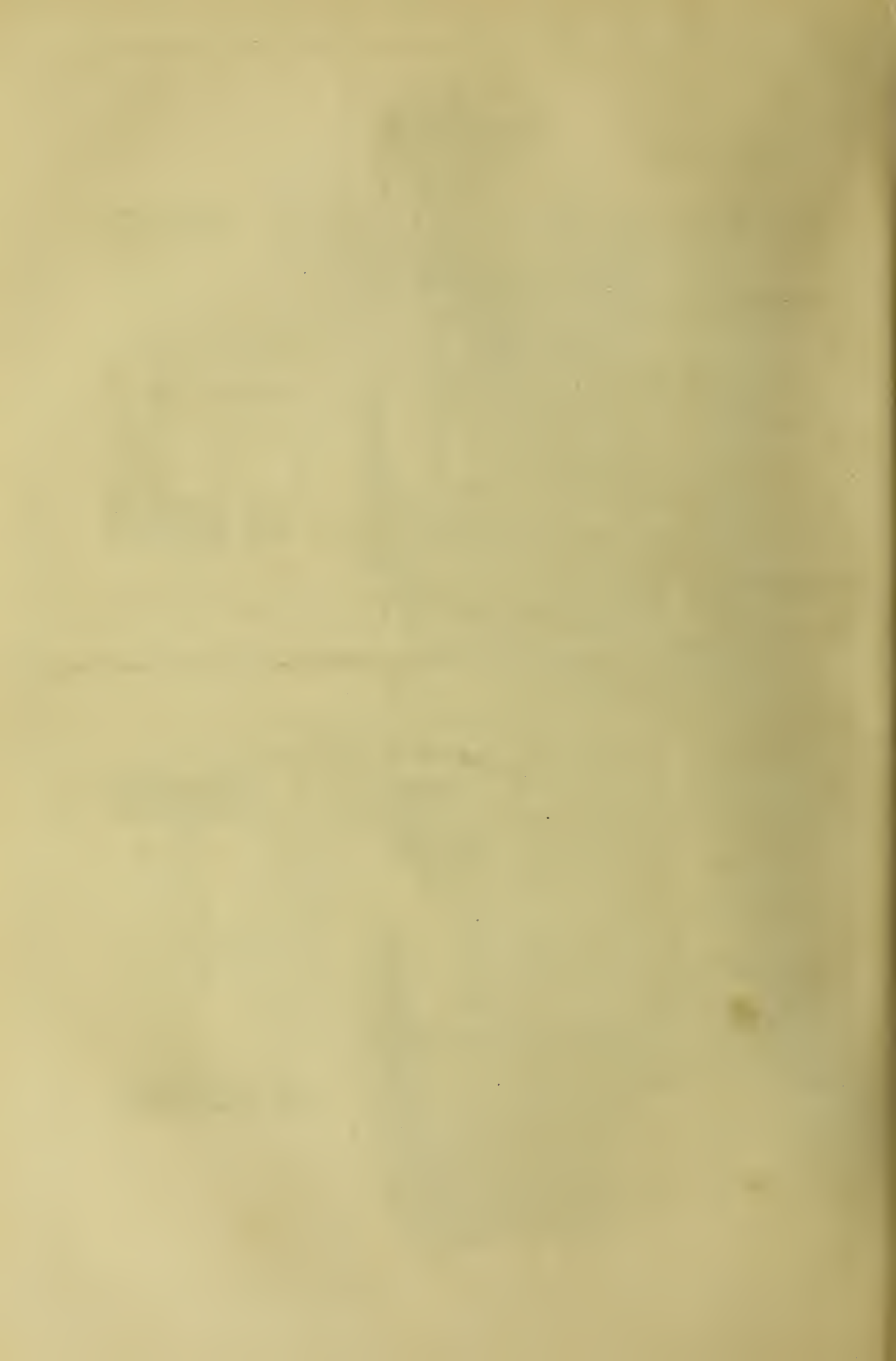
Alfred Langston, Arch. L.



GROUND PLAN



FIRST FLOOR PLAN



ART TEACHINGS OF THE INTERNATIONAL EXHIBITION.

BY OMICRON.

WHATEVER the amount of success, whatever the shortcomings, of the International Exhibition of 1871, there can be no question that the managing body have made ample provision, in point of amount at least, if not of authority, for recording its composition and results to the world. A staff of reporters, forty strong, superintended by Lord Houghton as general editor, with Mr. A. C. King as his assistant, has been appointed to take stock of the contents of the exhibition, in its various sections, and to record their individual impressions about them, and the principles of theory and practice involved in their production. A considerable majority of the gentlemen selected for this responsible service being, as far as we are aware, what may be termed "new hands"—new, at least, to the literature of art and industry—there is often a freshness and daring about their suggestions which contrast in an amusing manner with the more learned disquisitions which we have been accustomed to read in the class-books upon the various subjects. Moreover, as may reasonably be supposed, it happens that amongst such a multitude of judges, many of whom have occasionally to tread upon common ground, there is here and there great diversity of opinion, which the noble editor, with all his well-known wide range of ripe acquirements, does not seem to have made any attempt to qualify or reconcile. The result is a collection of essays, which, however striking for variety and novelty of opinion, cannot be accepted as texts on the subjects of which they treat.

We restrict ourselves on the present occasion to the reports on Division I., that of the Fine Arts, pure and as applied to manufactures and articles of furniture, which are sixteen in number, by fifteen different hands, two only (those on "Furniture, Iron, and Metal Working," and on "Tapestries, Carpets, &c.") being by the same writer, Mr. J. H. Pollen. These reports are comprised in four parts, of about fifty small quarto pages, which are issued at the price of one shilling each. Upon this mode of publication, so at variance with the economic tendencies of the age, we cannot help remarking that if it had been considered desirable to give these talented productions a wide circulation, in the interests of popular education, a much cheaper form of issue might have been adopted with advantage. But this, perhaps, would not have conformed with the commercial interests which seem to prevail over all other considerations at South Kensington.

First in order is the Report on "Paintings in Oil," by Sir Coutts Lindsay, a gentleman new to us as an authority in Art, and peculiar in some of his notions. His opinion of the quality of the materials afforded him by the Exhibition is not very encouraging, though, we fear, but too true. The recent commotions in the moral atmosphere of Europe, he says, have acted unfavourably as regards contributions from abroad, inasmuch that "most of our Continental galleries are either filled by (with?) inferior works or not filled at all;" whilst, as regards home produce: "the number of pictures is great, and the average worthy of exhibition; yet the Royal Commissioners have not been able to obtain a sufficient number of the best works of our principal painters, and have, further, been induced to dilute the collection with indifferent works, more appropriate for the yearly exhibition which will henceforth be opened in these galleries;" a statement, which, unfavourable as it is as regards the present, is still more discouraging as to what we are to expect in the future.

In the dearth of subjects in the collection worthy of individual notice, Sir Coutts Lindsay indulges in some remarks upon the history and practice of art, ancient and modern,

which, brief as they are, challenge criticism, as being likely to be attended by evil consequences, wherever their influence shall extend, if not confuted. He hails with approval what he is pleased to describe as "a new influence, which bids fair to modify the English method of art study, and to draw together the long-separated schools of oil and water colours." This appears inapplicable at first, when we reflect that water-colour painting, properly so called, is only a century old, and that it never had any connection with oil painting; but we catch a glimmer of the author's meaning when, in the next sentence, we find him referring to tempera as being equivalent to, or, at any rate, falling under the same category as, water-colour painting. This he follows up by a very bold assertion upon a subject upon which a very considerable difference of opinion exists amongst experienced critics and men of practical attainments:—"The English art of water-colour," he says, "which twenty years since was confined to what may be more properly termed tinting on paper, has made, during the last fifteen years, a remarkable approach to the old system of tempera—gradations of body-colour cover the paper, which is treated merely as a canvas, its white surface no longer representing the quality of light shining under transparent washes of colour. The system of using a white pigment, tempered with water or egg, to represent light (which is, indeed, properly called 'tempera') approaches to the same system as oil painting, its only difference being the vehicle with which the colours are mixed. Since the two systems have converged thus closely, our painters have begun to make excursions across the border-land of the two methods, a feat at one time quite beyond their powers."

This and much that follows involves important questions as to the conditions both of water-colour and oil-painting, which it becomes important to consider. These conditions we are prepared to hold are, by the nature of things, entirely distinct, except only in respect of the legitimate effect in both being generally the result of the transparency of the pigments, lying upon and illuminated by a white ground. Sir Coutts seems disposed to repudiate this theory, and, in the case of water colours, at any rate, insists that gradations of opaque or body colour are preferable to the effect of a white ground shining through washes of transparent colour. In this theory he is at variance with the evidence of experience, as well as the opinions of men practically acquainted with the subject. In support of our position we cannot, perhaps, do better than quote a few passages from the well-written report of Mr. Samuel Redgrave "On Painting in Water Colours," which immediately follows that of Sir Coutts Lindsay on oil painting. This gentleman, after describing the origin and progress of this new and truly national art, and giving a list of the principal practitioners from the days of Thomas Sandby down to Hunt and Cox, members of the Old Water-Colour Society, who "apparently reached the perfection of which their art is capable," states distinctly that "their practice admitted of no mixture of opaque and transparent colours." The innovation of using body colours (together with, let us add, the equally reprehensible practice of chipping and scraping the surface of the paper, for the production of high lights), is of comparatively modern date, though of earlier origin than the period of fifteen or twenty years ago fixed by Sir Coutts Lindsay; and the inducement to its adoption was simply commercial, the object being to produce pictures of a larger size than heretofore, in emulation of oil painting, and to obtain a temporary advantage on the walls of the Exhibition for the purpose of ensuring a sale. Turner, however—and can we produce a brighter example in evidence?—"never attempted to exceed the true limit of size of which the art is capable." With

transparent colours he produced the most refined gradations of tint, the most brilliant effects of light, and, eschewing the use of body colours himself, he declared "that water-colour painting would be totally ruined, and lose all its individuality and beauty, by the bad practice, then first tried, of mingling opaque and transparent colours." Of the pernicious effects of the opaque system Mr. Redgrave particularly specifies the deterioration in point of colour, the flesh tints being black and dirty, the tints generally being heavy and woolly, particularly in the distance and sky, as well as the falling-off in point of execution, which, led away by the facility afforded for producing strong effects, often by force of material, not of labour, is "loose and slovenly, losing all its true beauty and finish."

On the other side of the question—namely, the proposed application of water-colour, or more properly tempera, in connection with oil-painting, we find Sir Coutts Lindsay supporting his proposition by averments of fact which are not tenable, thus showing ignorance as well of the essential conditions as of the history of Art. Sir Coutts tells us that "water-colour painters have gained a reputation in oils, and oil-painters have recovered the habit of using water-pigments in the initiatory stages of their works;" and that "this practice, which was adopted by the earliest Venetians, has many advantages of a technical nature, which we will leave to the consideration of the profession." Is it not a pity that our amateur reporter did not himself consider the subject, aided by the counsel of professional men, before venturing on so bold a position? He then mentions Messrs. Marks, Walker, Burne Jones, and Leslie as having "first led the way in this interchange," with the result of an "improvement both in the colour and in the quality of the painting;" and sums up as follows:—"They have imported into their oil-paintings many of the excellences which had previously been considered the exclusive heritage of water-colours, and varied the treatment of material from a knowledge of the fellow art. The works of some of these artists bear a close resemblance to those of the fourteenth century, when tempera and oil were equally used, and for this reason, that they work with the same materials."

Upon this has to be remarked, in the first place, that Sir Coutts Lindsay is strangely in error in his concluding statement that oil and tempera were "equally used" in the fourteenth century; Van Eyck's improved method of oil painting—essentially "oil"—as distinguished from "tempera" painting, was not invented till the early part of the fifteenth century, and did not find its way into Italy for sixty or seventy years after its invention, being at first only partially adopted. The oil-painting of the fourteenth century was an altogether different process, that material being chiefly applied for decorative purposes on stone, iron, and other structural work capable of being dried in the sun. In the rare instances in which it was employed in painting pictures, as Sir Charles Eastlake informs us, it was, together with gilding, adopted only "in the complemental and merely decorative parts," the flesh of faces, hands, &c., being afterwards painted in tempera in spaces left vacant for the purpose. So that, although oil and tempera were occasionally used conjointly in pictures of this period, the oil process was not that now employed, and the two processes were so used upon separate portions of the work; it being remarked that the parts painted in oil, from the greater coarseness of the material, were always thicker than those executed in tempera. Sir Charles Eastlake, in his "Materials for the History of Oil Painting," mentions the case of a picture by Ghirlandajo, the teacher of Michael Angelo, the composition of which is remarkably illustrative of the process just mentioned, the two methods being applied to distinct por-

tions of the work. The subject is the Madonna in Glory, adored by saints and angels below. The two kneeling figures of S. John and S. Francis are in oil; all the rest of the picture is in tempera. The figures in oil are supposed to be by Francesco Granacci, one of Ghirlandajo's scholars, and the inference is that the picture was left unfinished by the master, who never painted in oil.

(To be continued.)

ARCHÆOLOGICAL.

CARNARVON CASTLE.—It appears, by a letter to the *Times*, from the Deputy-Constable of Carnarvon Castle, that the authorities of the town have permitted, if not encouraged, ill-advised encroachments on the moat of that ancient fortress, which is one of the most picturesque and important of our castellated remains.

CUMBERLAND AND WESTMORELAND ANTIQUARIAN AND ARCHÆOLOGICAL SOCIETY.—A meeting of the members of this society, in conjunction with the Durham and Northumberland Archæological Society, took place last week at Kirkby Stephen. The members of both societies assembled at the railway station, and proceeded in conveyances to Warton Hall. Afterwards, after thoroughly examining the hall, some of the visitors returned to Kirkby Stephen, while others went to visit the ruins at Pendragon, on the banks of the river Eden, where tradition tells us the father of King Arthur lived. The members and their friends met at Kirkby Stephen Church, which is now undergoing restoration. A paper touching the history of the building was read by the Rev. J. F. Hodgson, of Staindrop. From Kirkby Stephen the members proceeded to the ancient castle of Brough, formerly one of the seats of the Viponts. With the inspection of Brough Castle and Church the visiting for the day ended, and the party returned to Kirkby Stephen. In the evening the members met at dinner at the King's Arms Hotel. Mr. Mason, of Kirkby Stephen, presided. Next day the members of the societies left Kirkby Stephen for Appleby. On reaching the town, they proceeded to the church, and under the guidance of Archdeacon Boutflower, examined closely the objects of interest in and around it. From the church they proceeded to Appleby Castle, the residence of Admiral Elliott. Previous to examining the interior of the tower, the Rev. C. F. Weston read a portion of a pamphlet upon Appleby Castle, prepared a few years ago by the Rev. J. Simpson. After luncheon they left Appleby in conveyances for Brough Castle, Yanwath Hall, and Penrith, for the purpose of inspecting the interesting prehistoric remains in the immediate neighbourhood of these places.

WATER SUPPLY AND SANITARY MATTERS.

WISBEACH.—In compliance with an order sent down by the Home Secretary, the Local Board of Health of Wisbeach and Walsoken are entering upon a complete system of sewage. Already upwards of 200 acres of land have been purchased, at a cost of £1,000 for the utilisation of the sewage by irrigation. Mr. Easton, of Southwark, London, has been appointed to carry out the works.

INVERURIE.—The utilisation of the sewage of Inverurie is now under the consideration of the town council. It is proposed to utilise the sewage in the irrigation of land, and the haugh lying between the river Don and the Great North of Scotland Railway, an extent of from 8 to 10 acres, is fixed upon as a suitable field for experimental operations.

METROPOLITAN WATER SUPPLY.—Dr. Frankland, F.R.S., reports that on the 18th inst. he found the water delivered by each of the eight companies supplying London to be clear and transparent; on the 22nd the samples drawn from the mains of the Chelsea, West Middlesex, Grand Junction, Lambeth, New River, East London, and Kent Companies were equally bright and clear; on the 23rd, however, the water delivered by the Southwark and Vauxhall Company at the cab rank opposite S. George's Church in the Borough was slightly turbid.

BIRMINGHAM.—The Town Clerk of Birmingham has received an official communication announcing that Dr. Buchanan, of the Medical Department of the Privy Council, has been appointed to make an inquiry into the asphalt system, so extensively used in Birmingham, and its effects upon the health of the town.

A handsome new school, erected by Mr. John Pender, on his estate of Minard, Argyshire, was formally opened on Tuesday, the 19th inst., in presence of a large company. Mr. Pender delivered a suitable address on the occasion.

Building Intelligence.

CHURCHES AND CHAPELS.

BARNSTAPLE.—The new chapel of ease at Travellers' Rest, Barnstaple, was consecrated on Monday last by the Bishop of Exeter. The style is Early Gothic. There is a central aisle running the length of the building, and on each side the seats are ranged. The pulpit, desk, &c., are neatly carved with plain geometrical figures, and the windows are all formed into combinations of trefoils. Messrs. Gould & Son, of Barnstaple, are the architects.

CARNFORTH.—The first church in the town of Carnforth, near Lancaster, was commenced a short time since. The church will be in style fourteenth century Gothic, and will consist of nave 58 feet by 25 feet, chancel 26 feet by 19 feet, with south aisle and transept, vestry, and organ-chamber, &c. Provision is made for future north aisle and transept. A tower and spire of the height of 100 feet will be added when funds permit. The church will seat about 340 adults (sittings free); it is to be built of gray grit stone, and white freestone dressings of the neighbourhood. The roofs will be open timbered and boarded, stained and varnished, and the seats of pitch-pine, with carved bench ends; stone pulpit and font are gifts to the church. The cost, as at present contracted for, is about £1,600, inclusive of tower and spire. The architects are Messrs. Brade and Smales, of Kendal. Mr. R. Clarkson, Mr. Edward Parkinson, and Mr. T. Walmsley, of Carnforth, are the respective contractors.

COPFORD.—Workmen, while engaged in some much needed repairs to the east end of the parish church of Copford, and in preparing for a memorial stained window which is to be placed there, discovered beneath the whitewash evidences of colouring. Under the guidance of the architects (Messrs. Slater & Carpenter, of London) and Mr. Joseph Grimes, the whitewash has been carefully removed, and disclosed the fact that the whole of the east end of the church was formerly painted in fresco. An artist has thoroughly examined the paintings, and it is understood that an attempt will be made in the spring of next year to restore what were evidently beautiful frescoes. It is somewhat singular that that these paintings have not been "unearthed" before, as in Wright's "History of Essex" we find the following in reference to Copford Church:—"In 1690 it was completely restored at the charge of the parishioners, on which occasion, as the workmen were preparing the walls for whitewashing, it was discovered that very good paintings of the Crucifixion, of Peter's mother-in-law lying sick of a fever, of Mary Magdalen, and other subjects, had been covered with whitening."

DERBY.—On Sunday week the Bourne Memorial Chapel, Kedleston-street, Derby, was opened. The plan of the building is nearly square, the internal dimensions being 60ft. by 55ft., and 33ft. in height. The sittings on the ground floor are arranged in a circular form round the rostrum and communion enclosure, with a sloping floor. The gallery is also circular on plan, with ornamental iron scrollwork to the front. Accommodation is provided for about 1,000 adults. The Derwent Foundry Company supplied the heating apparatus. The exterior is built in Derby white bricks relieved with red bricks in patterns to the arches and bands, and encaustic tile panels. Stone dressings are introduced, with moulded and carved impost, cornices, and columns. The cost of the work is about £3,000, and the works have been executed by Mr. E. Dusautoy, from the designs and under the superintendence of Messrs. Giles & Brookhouse, architects, Derby.

EVERTON.—Hamilton-road Unitarian Church, Everton, the memorial stone of which was only laid in May last, was opened for public worship last Sunday, by the Rev. James Martineau. The church contains sittings for about 420 persons, the cost of which, exclusive of land, was £1,248. The works have been carried out by Messrs. John Parker & Son, under the superintendence of G. H. Thomas, and Mr. Borst has acted on behalf of the committee.

EXETER.—S. Thomas's Church, Exeter, was on Sunday last, formally re-opened, after repairs and alterations. The interior has undergone quite a metamorphosis, and all the high pews have been removed. The work has been carried out by Messrs. Hunt & Secombe, contractors, of Holloway-street, in accordance with the plans by Mr. J. Hayward, architect. The brass gas-stands were supplied by Messrs. Willer & Ford. A stained-glass window, illustrative of "The Incredulity of S. Thomas," is to be placed in the west window by Mr. F. Drake,

and another stained window in the south side of the church by Mrs. Beer.

HANDSWORTH.—The Congregational chapel at Handsworth was reopened on Monday, after enlargement. The internal measurement of the old edifice was 50ft. by 40ft. In length it is now 80ft. The proportion has been preserved by appropriating the back portion of its length to vestries, organ loft, and class-rooms for schools over. The organ has been removed from its former position to a gallery at the back of the pulpit. The floor has been seated with open pews of stained and varnished deal. The pulpit and platform are of pitch pine. The front of the edifice is in brick, with Bath stone dressings. It has an open porch, supported on columns with handsomely-carved capitals. One of the principal features of the front elevation is a large wheel window, traceted, and filled with lead lights of cathedral-tinted and stained glass. The west staircase is surmounted by a tower of about 70ft. high. Mr. Ingall, Temple-row West, has been the architect; and Mr. Stokes, Edgbaston, the builder.

MAYFAIR.—Christ Church, Mayfair, is being enlarged. The carving is by Mr. Anstey, the gas-fittings by Mr. Verity, and the slating by Mr. Sterling. The facing of Kentish raghammer-dressed headers, and the dressings of Bath stone supplied by Pictor & Sons, are ready worked from the quarry for setting. The interior facing is of parti-coloured bricks, in bands—yellow, red, and black, and a novel effect is obtained by the unusual predominance given to the darker colours, which are not introduced in the ordinary way as bands only, but occupy nearly a moiety of the whole surface. In some cases the arch stones are alternately Bath stone and black brick. The church, which is in the Early Decorated style, was built about eight years ago, from the designs of Messrs. F. and H. Francis. Mr. C. Fiske, of Pimlico, is the contractor.

S. PAUL'S, COVENT GARDEN.—Improvements are about to be made in the interior of S. Paul's, Covent Garden. The pews are to be changed for open seats, the aisles are to be freed from the overhanging galleries, which at present intercept a large portion of the light, and the organ is to be altered in position. Plans for the alteration have been prepared by Mr. Butterfield, and sanctioned by the vestry and Bishop of London.

WELLAND.—It is proposed to rebuild the church at Welland. Mr. J. W. Ingall, of Oxford, has estimated the cost at £2,000. The building will consist of a nave with south and north aisles; at the western end of the former the tower will stand, forming a south porch. The reredos will be of Caen stone, marble, and tiles. The tower will be carried up to a height of 40ft. in stone, and upon it will rest the ancient timber construction, which now appears as a stone tower to the old church, but which, in reality, is a fine specimen of massive and sound timber work in three stages, and in such preservation that it may be readily taken down and re-erected, the whole giving an elevation of 116ft.

WORLESTON.—On Tuesday week the cornerstone of a new church was laid at Worleston. The architect is Mr. Charles Lynam, of Stoke-on-Trent; the builders are Messrs. Powell & Co., of Pres. The church is cruciform in plan, and consists of nave, north and south transepts, chancel, organ chamber, and vestry on the north side of the chancel. The total length of the building is to be 80ft. 8in.; the width of the nave is to be 20ft. 8in.; the length of the transept 44ft. 8in.; and the width of the chancel 18ft. The interior will be fitted, in nave and transepts with open benches, and in the chancel with stalls. The walls will be of "Mow cop" and "Teg's nose" stone, the latter being of a dark salmon colour, and the former more inclining to buff—a very pretty combination. The walls will be in rubble work, both inside and outside. The dressings will be of Grinshill stone; the timbers of the roofs open, with plastered ceilings between the rafters. The style is Gothic, of the Geometric period.

BUILDINGS.

CASTLE FIELDS, SHREWSBURY.—The foundation-stone of the proposed schools for the district of All Saints was laid on Tuesday, the 19th inst. The building will consist of boys', girls', and infants' schools, the total provision, with the class-rooms, being for 260 children. The walls will be built of red brick, relieved with bands, &c., of white and blue brick. Mr. E. Haycock is the architect, and the contract has been taken by Messrs. Bowdler & Darlington, for £852.

HORSE-SHOE CLOISTERS, WINDSOR CASTLE.—These ancient buildings at the west end of the Chapel Royal of S. George, erected in the reign of Henry VII., have undergone a thorough restoration. There has been no variation in the horse-shoe style

but there will be a second archway to correspond with the one facing Henry VIII's gateway to complete the fetlock. At the north end of the cloisters is the library, which is being reconstructed in every respect. This apartment is supposed to have been the banqueting-hall of Henry III. Adjoining the library there will be an octagon turret, with a dome on the top and an oriel window at the end. The building is the Gothic style of architecture, and herring-bone brickwork. The restoration will cost upwards of £20,000, at the expense of the dean and canons of the Chapel Royal. The works, commenced eighteen months ago, are being carried out by Messrs. Field, Pool, & Sons, of Westminster, the architect being Mr. Gilbert Scott.

MANCHESTER.—The new Reform Club, Manchester, is now receiving its final touches, and it will be opened about the end of next month. The architect is Mr. Salomons, and the builders Messrs. Neill & Sons. Internally the ornamentation is in keeping with the external character of the building. The principal entrance, in the King-street front, leads through the entrance-hall and vestibule (which are ornamented with plaster arcading, and polished walnut and pitchpine wood) to the main staircase and the dining-room and billiard-room on the first floor. Encircling the building are regular suites of offices. The kitchen or culinary department is at the top of the building.

MIDDLESBOROUGH.—Messrs. J. Backhouse & Co., the bankers, have decided upon erecting new banking premises at Middlesbrough on an admirable corner site facing the railway and Exchange. The architect for the new building will be Mr. G. G. Hoskins, of Darlington, from whose plans and under whose superintendence new structures have recently been erected for the same firm at Sunderland and Bishop Auckland. Interior and exterior views of the bank at Sunderland appeared in the last volume of the *BUILDING NEWS*, pages 111 and 165.

WESTMINSTER.—The Westminster Club-house, Albemarle-street, is now undergoing considerable alterations and improvements. The whole of the roof and third and second floors have been removed, the object being to raise the height of the billiard-rooms, which will now be about 16 feet high. The works are being carried out by Mr. Childerhouse, under the care of Mr. Charles H. Cooke, architect, John-street, Bedford-row.

WIRKSWORTH.—The erection of the new town-hall at Wirksworth has been commenced. The ground floor contains market-hall, billiard, reading, and cloak-rooms, &c. The first floor is occupied by the assembly-room, and four other rooms to be used as occasion may require. The building will be Gothic in style, and has a tower 71ft. high at one end of the assembly-room. Beacon-hill stone will be used for facing the building, and Yorkshire stone for the principal staircase. The estimated cost is about £4,000. Messrs. Picton, Chambers & Bradley, of Liverpool, are the architects; and Mr. E. Thompson, of Derby, the contractor.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

Correspondence.

DESIGN FOR COUNTRY RESIDENCE.

To the Editor of the *BUILDING NEWS*.

SIR,—It is not altogether fair to criticise a building by the illustrations, for very frequently they do not properly and minutely present the actual works in such favourable light as the buildings themselves appear; but when we come to a mere drawing, or such, for instance, as a set of competition plans, we have no other mode of judging of its capacity or merits; but at the same time we must presume that such plans are set forth in the most favourable light in which it is possible for the work itself to appear, and in the best manner which lies in the power of the architect. Let us see, therefore, in how far the "country residence"—which, so far as we can judge, is nothing but a drawing—is so

superior to most other residences that it is honoured by a page in last week's *BUILDING NEWS*, as an example of what such buildings should be.

Taking the plan first, as of far more importance than the elevations, we find upon entering the front doorway the most objectionable feature which a house could possibly possess is at once made manifest—viz., a very long straight flight of stairs, exposed to view from without. In a grand public building a fine staircase is a noble feature; but in a retired private house the circumstances are altogether reversed, for what unostentatious lady would desire to be examined by strangers at the door upon ascending or descending her stairs? Again, the kitchen is over 50ft. away from the dining-room, to reach which the servants would have to traverse a dark passage and then to mingle with the family or visitors in the hall, and we don't know how many silk dresses or dress coats would be spoiled in a year by spilt gravy or rubbing up to fat and greasy cooks, all entering by the same door, and the house scented from basement to attics with "sweet-smelling savours and spiced meats," ascending through the main staircase. Strangers in the drawing-room above would be rendered like the beggar-boy standing at a cook's-shop, smelling dressed onions, which, because he could not enjoy them, was but a cruel satire on his hunger.

The freedom of entry into the main rooms is partially destroyed by the doors being crammed into corners. We almost invariably place the doorways so far from the corners as to allow a chair between it and the door. Where are the water-closets? Why, nowhere! Neither one for the servants, and that for the main house fixed exactly in the middle of the building, without light or ventilation, and entered only through one of the principal rooms, a greater blunder than which we never saw perpetrated even upon paper.

Supposing the washing were accomplished in the scullery, would not the kitchen and the whole house become saturated with steam and effluvia, which, added to the scent of cooked meat, travelling where it listeth, render the whole house unhealthy? Presuming the drawing-room placed on the first floor, as the description states (though a very questionable act), we cannot find a single bedroom of any fair proportions, although the building is more than 100ft. in length, and to all appearances the family would have to stow themselves away by night in the attics.

Looking briefly at the perspective, we would ask, are not the roofs greatly exaggerated in height without adding much to their beauty? So near as we are able to scale it, that over the bay cannot be less than 18ft. or 20ft., or nearly equal to the width of the rooms, and certainly much higher. We are told that this room is supposed to have an open-timbered roof. Well, we have in our day designed open-timber roofs, and our practical investigations have led us to the conclusion that for interior effect, either aesthetically or acoustically, a very stiff roof is in no way superior to a flatter one of say 45 or 50 degrees' rise. It is a very common practice for draughtsmen to exaggerate the apparent height of the roof, and ought not to be allowed.

Neither the use nor the advantage of the circular turret are made manifest upon the plan, and, notwithstanding it helps in a very great degree indeed to balance the parts of the picture, and is an excellent fill-up, yet I question whether Mr. Thomas Lennox Watson would quickly find a client ready to expend £150 on the corner of a servants' hall simply "for effect."—I am, &c., H.

INIGO JONES' (SO-CALLED) WATER-GATE.

SIR,—With regard to the letter in your last week's journal on the York Stairs Water-gate, it appears to me that the writer thereof knows nothing about what he so freely delivers his dictum upon. In the first place, he attributes the authorship of the design to Inigo Jones, whereas he ought to be aware that it is by Nicholas Stone. His estimate, too, of the merits of the design is as incorrect. It savours, to me, of an overweening vanity in this person setting up his isolated opinion in opposition to the long-established judgment of the many. The Water-gate is unimportant in size, but it must be a very careless observer who does not appreciate its graces, displaying as it does, what is so rare to see, genuine artistic feeling—the poetry of architecture. The rabid way in which some Gothic votaries affect to ignore the beauties of the Classical styles, discovering no merit but in Gothic art, is just as unreasonable as a man blessed with two eyes obstinately shutting one, determinedly refusing to see but out of the other. A man may, and should, love Gothic architecture without being a bigot. In fact, I will assert that if there is genuine and thorough admiration of Gothic art, there will be (as surely as the man is a true artist)

right appreciation of the beauties of *all* styles. The real art lover is a *catholic*. I beg to give as an illustration the name of Mr. Burges, a gentleman of established reputation as a Gothic architect, and who is notably free from, and superior to, the miserable affectation I have referred to.—I am, &c., PHILLO.

WALL TILES AT THE INTERNATIONAL EXHIBITION.

SIR,—As the terms in which our exhibits are referred to in Mr. Richard Redgrave's "Report on the Present State of Design as Seen in the Manufactures in the International Exhibition of 1871," published *in extenso* in the issue of September 8th and succeeding number of the *BUILDING NEWS*, are likely to lead to a misapprehension, and convey the impression that we are merely dealers and exhibitors having no part in their production, we shall feel obliged if you will make it known that the exhibits in question are the joint production of Messrs. Maw & Co. and ourselves; the painted tiles, or, as we prefer to distinguish them, the art tiles, being painted and fired by us at our own establishments in London; while the tiles, enamelled borders, and architectural majolica with which many of the specimens, notably the staircase decoration, are combined are from the works of Messrs. Maw & Co. These particulars were fully given in the forms which accompanied every object sent in, and had they properly appeared on the label attached to each, much confusion and annoyance would have been spared both to Messrs. Maw and ourselves.

We gladly acknowledge the assistance of Mr. Elden as the designer of many of the exhibits, although many also are by other artists. Two of the specimens singled out for special commendation—viz., the No. 7 and the figure of S. Luke, are from designs by Mr. L. F. Day and Mr. F. Weekes respectively.—We are, &c.,

W. B. SIMPSON & SONS.

457, West Strand, W.C., Sept. 27.

BUILDING TRADES' SCHOOLS.

SIR—I was much pleased on reading an article in the *BUILDING NEWS* for September 22, on Building Trades' Schools, as I was not aware that such a school existed, although the idea has often occurred to me of attempting to start such a class, as I believe it to be of practical value to the mechanic, especially young beginners or apprentices in the various trades, and I should like to see such classes in every town in the kingdom, for there is a great want of technical knowledge amongst mechanics in the building trade.

I do not think it probable that professed teachers could be obtained in all towns, neither would it be necessary, for if the working men would take sufficient interest in the matter, the classes might be made mutual improvement classes.

Let him who possesses a better technical education than the rest instruct his fellow workmen, and by so doing he would continue to improve himself.

I should like to see the opinion of some of my fellow workmen on this subject, as I think it an all-important subject, especially to young beginners in the building trades.—I am, &c.,

FRANK CHESSELL.

Woking, Surrey, September 24.

BLACKBURN FREE LIBRARY AND MUSEUM COMPETITION.

SIR,—As there can be no duality of opinion as to the whole of "the selected eight" being designs, far, far in excess of the stipulated cost, would it not be more in consonance with the principles of equity (on which this model competition was to be conducted) if the consulting architect were allowed to make his final selection from the whole of the designs submitted, instead of being limited to the "eight" as at present contemplated? To put competitors on the back who glaringly infract the great commandment as to cost is neither a moral nor commendable proceeding, and is manifestly unjust to those who "counted the cost," as I did.—I am, &c.,

£5,500.

WINDOWS OF S. LAWRENCE, SOUTHAMPTON.

SIR,—I take the liberty of informing you that the windows mentioned in your number of the 15th inst., as being set up in the chancel of S. Lawrence's church, Southampton, were designed by myself, and executed by Messrs. Heaton, Butler, & Bayne.—I am, &c.,

Bruges, Sept. 23.

W. C. BRANGWYN.

IRON CHURCHES.

Sir,—Permit me to draw the attention of the patrons and builders of temporary iron churches, &c. to an example which is well worth their consideration. I refer to the dissenting chapel in the Hampstead-road, Camden-town, at the corner of Granby-street, Harrington-square. It is, to my mind, the only erection of the kind with any pretensions to taste, and must, I should say, have been designed by an architect. I do not mean to say that it is perfect, but it is well worth studying, and if its principles are carried out, we may hope to see an improvement in future works of the same class. My remarks refer only to the exterior, as I have never been inside it.—I am, &c.

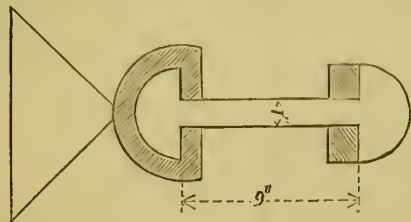
TUBAL.

Intercommunication.

QUESTIONS.

[2320].—Is an Iron Porch a Fixture?—It appears to be generally accepted that a chattel fixed to the premises by a tenant for the purpose of ornament may be removed during his term or tenancy, if it can be so removed without injury to the premises. May an iron porch fixed in front of an entrance-door be so removed? The pilasters or supports are fixed by lugs into a stone supported on brickwork. The cantilevers next the house are fixed into the wall by lugs, and the iron framing at apex and eaves next the house are let into wall. The roof is boarded and covered with zinc, with zinc flashings cut into the wall.—ARCHITECT.

[2321].—Cement Test.—I should feel obliged were you or some of your readers to kindly inform me as to whether or no I am correct in employing the following test for Portland cement, my method being as follows:—Having made a mould for the cement giving a web 1in. square and 9in. long with a couple of circular ends, I support the cement upon a 1in. square iron fork at the



neck, as shown by the shaded lines; while at the bottom I have a cramp, also shown by shaded lines, to which I attach a wooden board for receiving the weights to be applied, as shown. The cement, after being taken from the mould, is allowed to remain in water for seven days, being then tested. Probably, however, some one will give me a few practical hints on the subject and average tests.—ASSISTANT ENGINEER

[2322].—Brick Clay.—On what principle should one going on to a new brick ground test the clay for making of good bricks? Is there any difference in making bricks by hand and machinery in point of quality? I am informed that machinery does not at all times turn out good stocks, owing to quality of clay.—Bogwood.

[2323].—Paperhangers' Canvas.—I am about to put up a light partition across a large room, so as to divide the latter into two smaller ones. The framework I intend making of wood battens, about 2ft. apart, and across these I propose to stretch paperhangers' canvas, on which the paper will be pasted. Can any reader tell me whether the canvas should be put on wet or dry?—HANDY MAN.

[2324].—White Lead.—What way is there of testing white lead, genuine, from No. 1, and No. 1 from No. 2, &c.; and are the genuine white lead casks always branded, "Genuine, warranted?"—S. H.

REPLIES.

[2308].—Moulded Stone Steps.—I cannot agree with "Clerk of Works" in his reply to above query.

As he would place the door, the door-frame would have to pass the top step, and rest on the landing below, which would be bad. The position of door and step is usually, and rightly, governed by the door frame. This is commonly let into top step, and generally stands 4 1/2 in. from face of wall, thus the top step will show at least 3 in. beyond the door (see dotted line), or it may come out to face of wall, when it would show about 7 in. Either would look better than not seeing the step and would not be objectionable as regards the wet, though if the step projected as much as "Augustine"

recommends, that is to correspond with bottom step, it might be objected to. I append sketch plan, and should recommend step to be, if door frame is only 4 1/2 in. from wall, at A. If reveal is 9 in, I should put it at B.—P. E. M.

[2314].—S. Michael's and All Angels', Brighton.—Mr. Bodley was the architect of the above church, and the cost was, I believe, between £7,000 and £8,000.—G. I. C. C.

[2316].—Plastering of Walls.—Neither Keene's nor Parian cement are non-porous as ordinary plain trowelled work. To make them non-porous they must be polished, the cost of which is about four times as much as trowelled work. I should say that Keene's fine quality cement mixed with umber or ochre will answer the purpose for "W. W.," and is no doubt preferable to Parian on account of its greater hardness. If on brick walls Portland cement should be used as a rendering coat.—J. no. W.

Our Office Table.

AN EEL IN THE PIPE.—The pollution of our drinking water, remarks the *Lancet*, is of much more complex origin than is generally known. Before entering the various channels of distribution, the water, as it leaves the reservoir, passes through a kind of sieve, which is thought to keep back non-drinkable ingredients of the grosser sort, such as straws or twigs—to say nothing of drowned kittens and puppies, which will sometimes find their way into these handy receptacles. The meshes of the sieve, however, are by no means so fine as to exclude infantine eels, which thread the barrier, descend into the channels of distribution, and finally enter the water-pipes. By this time, thanks to the nutritious qualities of the liquid with which London slakes its thirst, the enterprising apodian has developed to a considerable bulk, until the pipe becomes such a very tight fit that further progress is impracticable. There it sticks—either till the impeded water above it causes the pipe to burst, or till death by pressure leaves it to decompose and taint the drinking supply of some household. This occurrence is much less rare than is popularly suspected. We have instances within our knowledge in which the gardener of a suburban villa has cut through a pipe and the head of an immense eel at the same time—thereby disclosing to the puzzled householder the cause of the leakage of water above the point of obstruction. A vivarium is an excellent thing in its proper place; but we object to its uses being subserved by our water-pipes, to the possible arrest and certain pollution of our drinking supply.

BATTERSEA PARK.—It is stated that certain alterations on the river embankment at Battersea Park are now contemplated, in compliance with a letter forwarded to the First Commissioner of Works by the Battersea Vestry from Mr. Condy, with reference to forming a day and night roadway between Chelsea Suspension-bridge and Old Battersea, for foot passengers, carriages, carts, cabs, &c., along the frontage of the river, railed in from the park and river, and lighted.

THE HOTEL DE VILLE OF PARIS.—A third plan has now been brought forward by MM. Perrin and Charles Blanc to rebuild the small façade of the old Hôtel-de-Ville, Paris, and to erect at the sides and in the rear low buildings for offices, which, having no pretension to match the other, would leave the original work of Bocador to stand alone in its former beauty. A sub-committee of the Municipal Council has been appointed to consider this new plan, and report on it.

FIRE AT BRADFORD.—About nine o'clock on Monday night a fire broke out in the premises of Mr. Thomas Halliday, joiner and builder, Little Hortoulane, Bradford, and in one hour a large workshop and spacious store-rooms, and a large quantity of timber stored in an adjoining yard, were entirely destroyed. The damage is roughly estimated at £8,000 to £10,000, and Mr. Halliday is insured to only a very small amount—£2,000 or £3,000. It was reported that two horses in the stables were destroyed, and that several persons were severely injured owing to the fall of a shed on which they were standing. The fire brigade exerted themselves with great energy.

EXHIBITION OF WORKS "IN BLACK AND WHITE."—A scheme of a very promising character has recently been set on foot, for an exhibition of works in black and white, which will comprise ancient and modern engravings, etchings, and drawings in pen and ink, sepia, crayons, pencil, charcoal, &c. We believe the collection will be exhibited in the Dudley Gallery, Egyptian Hall. If this plan has no more obvious advantage than that of forcing the attention of our artists to chiar'oscuro, the phase of design least cultivated in this country, it will be more than welcome, and highly beneficial.

So absurdly deficient is English art teaching in this respect that, not many years since, an eminent engraver, one of the very few masters of his art in England that are still alive, one who earned the warm applause of Turner, when he urged on a venerable Royal Academician the importance of affording instruction in chiar'oscuro to the students of the Royal Academy, got for his reply, "Ah, indeed, very true; but who is to teach it?"

WREN'S CHURCHES.—The *City Press* of Saturday last, referring to a paper read before the Architectural Association a few months ago, and which, with the discussion thereon, appeared in the *Building News* for March 10 last, Vol. XX., pp. 178-9, says:—"We were rather amused the other day with the report of a discussion which took place a short time since at a meeting of architects, after the reading of a paper on Wren's churches. Judging from the tone of the remarks then made, it would seem that we have all been in the habit of considerably overrating Sir Christopher, whose genius, it is suggested, was by no means of a very brilliant order, and that, as a whole, he was rather below the standard reached by some gentlemen of the present day. One of the speakers professed himself quite ready to undertake the improvement of Wren's churches, and intimated that if called upon to superintend the restoration of any of them he certainly should not think of slavishly adhering to the original designs. Another declared the famous architect's churches to be 'very ugly.' Much was made of the fact that his daughter is credited with the designs for some of his best spires, and it was more than hinted that, as he himself was generally pretty busy, it was exceedingly probable that in many cases his assistants supplied the plans while he appropriated the pay and the glory. In this way the reputation of the architect of St. Paul's was tossed about like a shuttlecock, and if it still remains uninjured small thanks are due to the prattlers who so vigorously endeavoured to talk it down. As the speakers were for the most part unknown men, it is to be presumed that they are all going to do great things, which shall place them on a higher pedestal than Wren's. When this has been brought to pass, it is possible that their judgment on their famous predecessor will command more respectful attention than has yet been bestowed on it."

PROPOSED TUNNEL UNDER THE TEES.—At the monthly meeting of the Middlesborough Chamber of Commerce last week, the necessity of further railway accommodation for the Cleveland district was discussed. A committee was appointed to consider the desirability of making a railway from Castle Eden through Wynyard to Stockton, as a portion of a scheme which must be extended so as to include Middlesbrough, and to consider whether a bridge across the Tees, or a tunnel underneath it, near Middlesbrough, would be best to meet the requirements of the district. Mr. Dunning, C.E., produced several sections showing the bed of the river Tees as it existed at Middlesbrough some ten years since as compared with the present time.

COVENT GARDEN MARKET.—The threatened transference by the market gardeners and nurserymen of a great portion of their business from Covent Garden to Farringdon market would appear to have impressed the Duke of Bedford, or his agents, with the necessity of something being done to improve Covent Garden market, for we find that three or four houses are in course of demolition in Wellington-street, with the view of enlarging the flower market, which will, we understand, be entirely re-covered with an iron and glass roof, and have a new frontage to Wellington-street. Although this may satisfy the requirements of the florists and nurserymen, the market gardeners and the vegetable salesmen will be no better off unless the two quadrangles of the market proper be covered in the same way. But even if this were done, the market would not shelter from the weather all who do business there, inasmuch as it is far too contracted in area for its trade.

THE NEW SCIENCE SCHOOLS.—In an article on the new Science Schools at South Kensington, which appeared in the *Times* of the 22nd of August, General Scott was stated to be their architect. That journal has since received a letter from Major Fowke, late of Her Majesty's 54th Regiment, inquiring what has become of certain plans and elevations for the permanent buildings at South Kensington which, Major Fowke states, were designed by his brother, the late Captain Fowke, R.E., and whether and to what extent they have been used by General Scott. Our contemporary is informed that Captain Fowke left behind him no complete plan or elevation for the new Science Schools; that he left a sketch elevation and a block plan, but that neither of these has been used in the present building.

THE BUILDING NEWS.

LONDON, FRIDAY, OCT. 6, 1871.

WHAT IT TAKES TO MAKE AN ARCHITECT.

WE remarked, two or three weeks since, that though the architectural profession may be overcrowded, it is certainly not overcrowded with architects. The country, doubtless, contains a vast number of young men whose period of articleship has expired, and who are looking about, either for independent practice or for situations in offices, as the case may be. But it contains comparatively few, in proportion to the amount of work to be done, who are really qualified to do that work, either in a primary or subordinate position. This state of things, though it is much to be regretted, is not at all surprising. It is an easy matter to get a youth articulated; it is an easy matter to take an office and put up a brass plate with "Mr X., Architect and Surveyor;" but it is far from being an easy matter to deserve these titles. To some of our younger readers it may be useful to indicate a few of the accomplishments they imply.

The first thing learned in the three, four, or five years of pupilage is usually drawing. It is a very important thing, for it is even more difficult for a man to be an architect without knowing how to draw than to be an author without knowing how to write; but it is far from being the only thing or the main thing, as most pupils not unnaturally suppose it. The great point is to know what to draw, and it is this, and not the method of drawing it, that takes up nine-tenths of the real architect's consideration. Doubtless there may here and there be found a person who has seen so strongly the mistake of making drawing everything that he has gone to the opposite extreme, and neglected it too much. But this is a rare exception, and students need to be warned—not, indeed, against taking undue pains to draw well, but against thinking that draughtsmanship and architectural ability are by any means identical. Drawing of course includes a knowledge of perspective, and this is a thing by no means so universal as it should be. Most assistants, it is true, profess to be able to make perspectives, and many of them, where time is unlimited, can do so with great neatness. But, in a large number of cases, no architect could put, for example, his competition plans and elevations into their hands and leave them to do the rest. He could not depend on their judgment to choose a good point of view, nor on their knowledge, without constant instruction, to draw the details; probably he could not even spare the time which would be consumed by their slow and mechanical mode of proceeding. Now, if the designer has to set out the view himself, to supply sketch sections of every arch and jamb and string-course and coping, to say nothing of the sculptured ornament, he may as well make the perspective at once. An assistant who cannot do this is no assistant as far as competition perspectives are concerned—and in certain offices these consume a large share of every year's labour. In other words, a mere acquaintance with perspective is not enough; the mere power of drawing, with whatever neatness, is not enough. A knowledge of style, and a perception of artistic fitness, are primary requisites, even for the assistant; and if for him, how much more for the independent architect?

Next to drawing is supposed to come construction. In practice it is too apt to come a long way behind, and to meet with less instead of more attention. There are fewer opportunities in most offices for the study of it, and then it requires thought and attention, not merely imitative talent. There is no easy, well-trodden track which leads

straight to the knowledge of it; and it would be difficult to prepare a really good and useful list of books on the subject. Construction, unhappily, as many modern authors have treated of it, is simply the art of mimicking, by the cheapest and flimsiest methods, the appearance of what is durable and substantial. Those oracles of the country carpenter, the productions of the late Mr. Peter Nicholson, are a perfect treasury of shams and falsities. Tredgold's carpentry is doubtless worth studying as far as it goes, which, unfortunately, is but a very little way. In the matter of roofs, for example, its author scarcely investigated any save those with a tie-beam straight across at the feet of the principal rafters; and the best that can be said of his designs is that they might have answered very well for railway sheds and similar buildings if iron ones had not already superseded them. As to these latter, and as to iron girders and bridges, books are more abundant. Engineering investigations may be very useful to the designer who takes care not to make an engineer's use of them: who does not fancy that calculation will serve him instead of thought, and feeling, and taste, and invention, and who does not persuade himself that the chief end of man is to bridge the widest possible space with the least possible quantity of material. On masonry, we hardly know what book to recommend, except M. Viollet le Duc's dictionary. There, indeed, Mediæval construction, in whatever material, is dissected and explained in the clearest and most thorough manner; and the student who had really mastered this one work would be by no means ill-furnished. Masonry, however, and carpentry, to a great extent, may be learned from our own Mediæval buildings, and learned in the most successful manner by any one who will take the requisite pains. The secret of learning it is to make measured drawings—plans, sections, and details to scale on the spot—marking every bed and joint as it occurs, and finding out the reason for each peculiarity, as far as it can possibly be done. The process does not make pretty sketches—it involves trouble and sometimes a little unpleasantness—but, more than anything else, it helps an architect to become master of his business. He sees the object of all these picturesque contrivances in old work which nine students out of ten copy and repeat without ever discovering that they were contrivances at all. He sees, by the light of the half-dozen centuries which have passed over them, where the buildings of the Middle Ages were constructively perfect and where they might have been improved on, and he comes to design with more and more ease as he learns, by example, the principles on which good design proceeds. But we had better, perhaps, not say too much on this head, lest genuine architects should multiply, and there should be a real overcrowding of the profession. Probably, however, the labour involved, and the unattractive look of the study, will prevent any such catastrophe. It is one of those secrets which may safely be told to the world, because the world will not believe it; and, like the man in the old story, who stood on London-bridge and vainly tried to sell real sovereigns at a penny a piece, we may publish it without any risk of its being generally made use of. Carpentry and masonry (including brickwork) are, of course, the main branches of building construction. But the others are by no means to be neglected. The fall of a ceiling, for instance, is not so bad as the fall of a house; but it is much too bad to be tolerated; and, as long as we employ plastering, it is part of our business to get it done properly. Very often, we fear, it is not done so, and the architect who takes pains with his walls and roofs pays too little attention to its unattractive details. Cement, again, varies beyond all calculation as to strength and time of setting; workmen, if they are not discovered, will often mix it up two or three times over, and without care

and a system of tests there is hardly any dependence at all to be placed on it. This happens most, probably, when only a small quantity is used—when only a few piers and bond-courses are built in it, while the rest of the work is in mortar. In such cases the mortar is very often stronger than the cement, and the latter sometimes proves no better than so much loam or road scrapings. Plumber's work is a subject, too, which calls for more attention than it generally gets. Of all things except ironmongery, it is the worst to economise in, and its failure causes the greatest annoyance. For their own sakes architects ought to insist on providing against such things as freezing of water pipes and accidental overflows of cisterns; and few building proprietors would grudge the trifling additional cost of preventing them. When the first hard frost of every winter brings the annual shower of letters to the *Times*—when architects get their periodical and not unnatural rating for want of common care and forethought, the client who had escaped the general plague would be able, with considerable effect, to recommend the architect who had saved him. Then there are two other equally important and cognate subjects, gas-fitting and warming by hot water, which an architect is obliged to acquaint himself with. His ignorance of either may lead to unpleasant results, as well as to much needless expense. The slater's is comparatively a simple trade to master, and ordinary care will prevent any failure here, and the rest will come more properly under the following head than under the present one.

Leaving construction—itself almost a study for a lifetime—the architect has next, or rather at the same time, to make himself a judge of materials. The two subjects are intimately connected, for a form of construction that may be perfectly safe in a good material may be liable to fail at a moment's notice in a bad one. The central tower of Chichester Cathedral, for example, which came down in a heap of ruins about a dozen years ago, would be standing now, if its piers had been of Portland or any similar stone. As it was, they consisted of a sort of shelly limestone, full of vents and open spaces, and when they were slightly cut away for the purpose of casing, their reduced section was crushed by the weight above. But all-important as the knowledge of materials is, it is in some respects more difficult to gain than even that of construction. It is far, indeed, from being as complex or as wide in its range, but opportunities for acquiring it are even harder to obtain. The fact is, it must be made a special study. The young architect must set about its attainment as a distinct and definite object, and must find out, too, the best way of attaining it. Much, no doubt, may be done by inspecting works in progress, and much experience will come, almost unconsciously, by the mere process of going about with one's eyes open. This, however, will not do everything, and special efforts are needed in particular directions. The different qualities of iron, whether wrought or cast, deserve the moderate amount of research which will enable them to be distinguished. Considering that they vary in strength as well as in price to the amount of 200 or 300 per cent., it is highly important that when we specify the best quality of iron we should know whether we have got it. The same remarks will apply to timber, and it is well worth the student's while to make a collection of specimens of its various sorts and qualities. A collection of building stones, too, is a most serviceable thing. They should have marked on them, or kept near them, a list of particulars, giving the name of the quarry from which they came, the address of its owner, the particular bed in the quarry they represent, their price there, per cubic foot; the distance from the quarry to a railway station, canal, or seaport; the means of ascertaining, by inspection, the proper bed of the stone, and an estimate of the cost of working it, as compared, say, with

Bath or Portland. To these may be added, as they are heard of, a list of the buildings, old or new, where it has been used, and a statement from observation as to whether it has stood well or badly in each. For want of such knowledge as this, the absurdest blunders have been committed. We have found architects, strange to the soil, taking Bath stone to Yorkshire, and Kentish rag to the borders of Northamptonshire! To carry coals to Newcastle has never been held a mark of wisdom, but this can only be described as carrying shale there. Stone, iron, and wood are probably the hardest materials to judge of. Bricks may be estimated according to their worth by a little practice, though it must be remembered that those with the hardest surface are not always the most durable. There is a smooth, clayey brick, common about Manchester and elsewhere, much harder outside than anything that is produced in Suffolk, which, nevertheless, disintegrates and peels off rapidly by exposure. As to lead, the weight may be estimated from the thickness, or more accurately, by picking up a small strip, weighing it and calculating its area. Painter's work requires some attention, and varnish needs well looking after. Once put on, it is too late, without trouble and expense, to set it right. Everybody, in fact, can judge of materials in this way after the event. It takes no technical education to tell that a bad building stone has been chosen when, as at the Houses of Parliament, it is visibly crumbling away at the sills and string-courses; it needs no chemical investigation of limes and cements to prove that the plastering is badly done when the ceilings fall; and it requires no study of gums and resins to show that the painter is to blame when the congregation literally stick to their pews at the first service in a new church. It is the architect's business to foresee that all these things are impending, and, foreseeing it, to prevent them; and here of course is the difficulty.

On first starting in practice, especially in any large town, it will be discovered that a quantity of miscellaneous information is wanted which we have not yet referred to. To be able to survey and level the site for a building is an important and easily-acquired accomplishment. Then in London there are the ins and outs of the Building Act to be studied, the forms of application to the Metropolitan Board as to lines of frontage, appeals from district surveyors' decisions, and many other purposes. Then in the City there are applications to the Commissioners of Sewers before areas and cellar entrances can be formed, there are questions of light and many other disagreeable but inevitable difficulties to be faced. These things have to be studied for the most part as they arise, they take such different shapes that it is of little use to investigate them in the abstract. But there is one most important subject not yet named, the preparation of estimates. Whether architects are to charge for taking out quantities or not, it is imperative that they should be able to take them out, and with something like accuracy, moreover, to price them afterwards. Quantity surveying and builder's prices are not learned in a day or even in a year, and the knowledge of them once gained require to be kept up by practice. It is, in fact, the stock-in-trade of a separate profession, and yet the architect is compelled to have something more than a superficial acquaintance with it. Then, for any one whose practice is not confined to a very limited area, it is important to know something about local customs in different parts of the kingdom. There are local ways of contracting; in the North, for instance, a building is still commonly erected by five or ten distinct and independent tradesmen. There are local ways of executing work, very often the best that can be devised for the materials of the district; and the architect will be very unwise if he supplants them, without inquiry, by his stock specification

clauses. There are local ways of measuring work, and for want of knowing these the different parties to the contract may have great difficulty in deciding on the price that is to be given or received. There are, lastly, local names for different sorts of materials and labour, so that a description which is clear enough to a London workman is little better than Dutch to a Northumbrian one. Items of this class, like those of a previous one, can seldom be learned to much purpose beforehand. But they need a special effort in each separate case, and without this, serious inconvenience may arise.

With the experience and information now described, some few of our readers may, perhaps, ask what more can be wanted? Here is labour enough, it would seem, for a lifetime; the man who has gone through it may surely sit down in peace and trouble his brain no more. Alas! all this knowledge put together does not make an architect; there are many men who have it all without deserving the title. For architecture is an art, and while knowledge by itself constitutes a science, knowledge and invention together are necessary to make up an art. All these facts which we have supposed to be learned—though almost innumerable, are but the tools with which the architect works. By the knowledge of these facts, and by his own faculty put together, he is now to set to work and produce good buildings: good in every sense, in design, arrangement, materials, and construction. If he has the knowledge and not the faculty, he might make a good builder or a good clerk of works, or a good quantity surveyor; but he cannot claim the title of an architect. Of the two, the faculty is even more important to architecture than the knowledge. It is sad to see a good design carried out in ill-selected materials, as it is sad to see a good painting decay from want of common care or prudence in its artist. The fault in each case brings its punishment; but no one refuses to praise Sir Joshua Reynolds because his system of mixing colours was reckless and ruinous; and no one denies Westminster Abbey to be a great architectural work, though much of its outside masonry has perished over and over again. These, however, are examples to be avoided, and he who is best qualified to design will generally be most anxious that his designs should last. But to architecture proper space will hardly allow us to allude. How many conflicting wants have to be harmonised, even in the simplest building, only those who have earnestly tried to do their best can understand. There is the general arrangement or plan—and this must be perfectly fitted to the uses of the building; it must be adapted, perhaps by much thought and ingenuity, to the contour and levels of the site; it must be lighted throughout, though possibly windows can only be placed in certain portions of the walls; and it must be adapted to a simple and satisfactory form of roofing. The making of a plan alone, very often, is like the playing of a most intricate and complicated game at chess—so complicated that almost every one would be beaten were it not possible to trace each failure up to its first wrong move, and so play the game over again. In strict truth, however, plans cannot be made alone. A design worth the name is a whole, and has to be evolved from its designer's mind as such. He must work out, by whatever means he can, plan, elevations, and sections altogether, and alter each to suit the others till all are what he wishes. The production of a real architectural design is not unlike a case of what, if we remember rightly, is called in algebra "indeterminate analysis," which relates to equations which may be solved in a multitude, or perhaps even an infinite number of different ways. If $x + y - z = 10$, then x may evidently have any value whatever, according to the values applied to the other unknown quantities. But if we get it settled that y and z shall lie between certain limits—

say between 1 and 20, we get, taking whole numbers, a limited set of results to choose from. This is generally analogous to what takes place in design. The number of reasonably admissible forms in any one case is not infinite, but is reduced by a variety of considerations. This shape, we find, would be too long or too wide for the ground, if it is to contain the required area. This other shape would give a badly-proportioned elevation or section; the third would be difficult to roof, and a third would cost too much money. So, by thinking about it long enough and earnestly enough, a fair solution is reached at last; and two or three of the chief "unknown quantities" being once settled, the others, as workmen say, "find themselves."

We say nothing of style, details, ornament, or sculpture; they are not to be treated of at the fag end of an article. But there remains one more difficulty for the architect to surmount, let his knowledge and ability be what it may, and this is the difficulty of getting the world convinced of them. It is not, we think, that the world takes any special pleasure in keeping down its ablest men; the fact is simply that it does not know them when it sees them. This is not surprising when we reflect how few of us can speak with certainty and actual knowledge as to the goodness or badness of anybody's work out of our own particular business. Still clever men do, as a rule, get appreciated sooner or later, unless by their own fault. As Pope said of Johnson when he was a young man, and as yet unknown, "they are sure to be *deterrés*." They have need of patience, undoubtedly, while they see quacks and pretenders flourishing, and they have admirable practice in learning to control their temper, when some influential friend recommends them to go and see Mr. Gables's new Gothic chapel, and try, if they can, to imitate it. Mr. Gables and his compeers, however, will not last for ever: "Deus dabit his quoque finem." The architect who really cares for his art will not abandon it for a little delay or a little disappointment. He will make his years of waiting contribute to his ultimate success, and will feel sure that, as the Spanish proverb says, "The stone that is fit for the wall will not be left in the way."

A CHANNEL TUNNEL.

THE triumph of the Mont Cenis engineers has revived a project which has long been in existence. It is nothing less than the tunnelling of the British Channel; and there are not wanting practical persons who, while appreciating the difficulties of the work, believe them to be by no means insuperable. We hear so much of the tedium, delay, and annoyances accompanying the present system of transit between France and England, that, no doubt, such a scheme, if shown to rest upon any probabilities of success, would be undoubtedly and universally welcome, though the tourists of the actual day could scarcely hope to derive much personal benefit from its execution. No doubt the generation which has created the Suez Canal and perforated the Alps has reason to put faith in its power of accomplishing other similar achievements, upon an even grander scale; but there is a vast difference between scooping an open channel through a desert, or hollowing a road with a mountain as its roof, and constructing a safe and solid highway with a peculiarly restless sea pressing upon its arch, and for ever chafing against the superincumbent mass. It is true, beyond question, that an immense progress has been made since the Thames Tunnel was regarded as a miracle of engineering and a wonder of the world; yet a Channel tunnel would be an almost wholly dissimilar undertaking. Still there are men with sagacious heads, not likely to dream, who think the performance quite possible, and who would be willing to enter upon it, provided the one great necessity—an adequate capital—were furnished. One

proposal is to avoid the chalk altogether, and following the Wealden, which contains prodigious masses of clay, extending from Dungeness to Cape Griznez, to burrow at a depth of a hundred feet below the bed of the sea, which, it is affirmed, could then be as easily kept out of it as the London pavements out of the London sewers. There is a rival line—on paper—from Dover to Calais; but we need not compare the two plans in detail. Both would run at an equal depth; the difference in point of distance would be only a mile and a half, and, as a means of communication, the one would probably possess little or no superiority over the other. The question, apart from absolute technicalities, is, are we likely to see this mighty enterprise taken in hand and completed? Now, as to its being an impossibility, that idea may be dismissed; but would it be worth the while of governments and speculators to assume the gigantic task, with all its many and undeniable chances of repeated disappointments and failures, and disasters to human life, of millions sterling swallowed up, of the labour being suspended, of one new capital after another being required, of contractors ruined and shareholders with them, and the sea being paved with more gold than the submarine traffic could ever repay? The engineers, who have carried one railway through and another over the Alps, would indubitably not shrink from their own professional share in the responsibility; but there is much more than this to be thought of. They have brought us within a few weeks' journey of India, China, and even Australia, it is true, and it may be expected that before long the most protracted steam voyage from one port to another on the globe need not exceed a month. We are growing accustomed to extraordinary applications of natural and mechanical power. The hydraulic arrangements for lifting enormous weights at Great Grimsby and Birkenhead do not astonish us now. We have ceased to boast about the Bramah press, which gave to a forty-horse engine the power of fourteen hundred, and raised the tubes of the Menai Bridge, each nearly a thousand tons in weight. The Great Eastern is as familiar, with all her vastness, in England as the giant pumping machinery for the Haarlem lake was to the dauntless industrial genius of the Netherlands. The blows of the Nasmyth hammer, the armour-plates of our ironclads, the twenty miles an hour speed of the Holyhead packets, the twenty-five thousand tons capacity of the Great Eastern, Krupp's monster artillery, the Cherbourg breakwater, the Bermuda floating dock, the Liverpool docks, the arch over the Dee at Chester, the bridge of Niagara, the Fell Railway and the Mont Cenis tunnel, the Atlantic and Pacific railroad, the "artificial Bosphorus" connecting the Red with the Mediterranean waters,—all these are testimonies to the tendencies of our epoch to attempt mechanical triumphs from the very thought of which the engineers of a former period—since the Cyclops and the Egyptians, at any rate—would have shrunk. The money for this Channel subway might doubtless be had; the materials, of course, would be forthcoming, and the difficulties of the work do not alarm the engineers of either country; the question, therefore, seems not far from being reduced to one of commercial calculation. But is a very serious question, notwithstanding, involving, according to the most moderate computation, an expenditure of £8,000,000, which, we should say, is merely fanciful, and as Gibbon said, when writing about Hannibal and his reputed passage of the Alps, a "sterility of fancy" in such matters is above all things else to be desired.

Now, it may be taken for granted that, to nine-tenths of people at least in certain weathers, the passage from Dover to Calais, though brief in point of time and duration, is abominable. There is, naturally, a chopping cross-sea in that part of the Channel, due to conflicting tides, winds, and currents, and

the steam-boats feel the rolling motion all the more for being so small. The question has often been put, why are they so small? The inevitable answer is, because larger vessels would draw more water than the harbours on either side could command. They are all four shallow at low tide, are greatly encumbered by mud and sand, and are much affected by inconvenient winds. The question is, whether to improve them, or to diminish the necessity for their use. Hence the tunnel schemes, which are various. There was talk of iron shafts running up from the bed of the sea as means of ventilation. Then followed M. Favre's plan, in which the tunnel, like Mr. Remington's, was to be a hundred feet below the level of the sea-bed; shafts sunk through the water and clay were to furnish facilities for excavating the great hollow and supplying it with air; and the trains were to be propelled by atmospheric pressure. The subsequent ideas of Mr. Nicol and Mr. Austin were, the one for a tunnel lined with an iron tube, the other for three parallel ways cut at a depth of only 60ft. below the weight of the water. But these imaginations were eclipsed by that of M. Thomé de Gamond, who proposed a tunnel ventilated by conical shafts, two of which were to be of such gigantic dimensions as to permit of winding roadways through their interiors, to a station buried 100ft. down in the clay. Some one has astutely observed "it is dangerous to laugh at engineers, for they have the knack of turning the laugh against us, by doing the very things which we have pronounced impossible," nor are we speaking of impossibility in this case, when Mr. Hawkshaw, Mr. Brunlees, and Mr. Remington have recorded their opinions in quite an opposite sense. But the question is not entirely that of a tunnel. Mr. Bateman, whose authority will not be disputed, declared that he could construct a railway on the actual bed of the sea, and avoid the necessity of excavating beneath it. The proposal, however, was, so far as we remember, not altogether his own. More than fifty years ago, two distinguished Frenchmen, MM. Tessie de Mottray and Franchot, suggested that a cast-iron tube might be laid and secured across the bed of the Channel, from Calais to Dover, of proportions to allow of wheeled vehicles to pass. Another Frenchman, M. Paycner, preferred masonry to metal, and wanted, by the assistance of the diving bell, to build a causeway from shore to shore of brick or stone. Mr. Winton thought of a railway in an iron casing; Mr. Zerah Colburn would have sunk his tubes, put together on the land, in lengths of a thousand feet each; Mr. Chalmers developed a magnificent notion, which would cost fifteen millions sterling; Mr. Cowan fancied an iron shell, lined with concrete; and Mr. Page, engineer of the new Westminster-bridge, declared for building on shore eight conical shafts of iron, towing them out, sinking them, and filling in with concrete the space between an inner and outer skin. A lighthouse was to be erected at the top of each, while at the bottom would be, of course, openings to the tube, which would be constructed in quarter mile sections, sunk, and joined by workmen descending in diving-bells. When some engineers asserted that men could not work under such an overwhelming pressure of water, Mr. Page affirmed that he could get rid of this difficulty with perfect ease. And so would Mr. Bateman, though in a different manner; he puts faith in a tube, but of a different construction, thirteen feet in diameter, and four inches thick, built up in sections, and put together within a peculiar kind of airtight chamber, at the bottom of the sea, to be pushed on as the work advanced, by hydraulic pressure. But then arose a practical inquiry, on the part of a doubting man, "You would have 60,000 joints in your tube, any one of which might get into trouble, and what would you do then?" Which pro-

blem we are far from undertaking at present to solve. It is only a sketch of the idea and its history that we are offering. Then, there has been the plan of a floating corridor, so to term it, midway between the bed and the surface of the sea, calculated to float at a depth of forty feet or so, and steadied by mooring chains and anchors, with immense granite piers on both sides, at either end, and cork-screw staircases. The proposal is meritorious on account of its courage, and of little else. Much the same may be said of the Babylonian projectors who undertook to erect a bridge, right across, on 400 piers, at a stupendous height, or to carry one across the sea level, with pivot openings and draw-bridges for the passage of ships, or to rear a structure with arches of 500 feet span at an elevation beneath which all her Majesty's fleet could sail. We are bound, for the time at least, to dismiss many of these schemes as chimerical. There is, however, the project due, we think, to Mr. Fowler, of a steam floating bridge, in the shape of an immense flat ferry-boat, adapted for an exact touching, at particular times, of either shore, below certain towers, considerably advanced into the sea, where, from an embankment, the vessel could be raised or lowered, at any level of the tide, to an evenness with the railway. We have had similar plans roughly drawn by Mr. Chinie, Mr. Daft, Mr. Grantham, and Mr. Bridges Adams, besides one by Mr. Galloway on a less ambitious scale. The most elaborate of them, however, includes the opening of at least two large and costly new harbours, whence the monstrous craft might be received and dismissed, works sufficiently easy on the English side, but presenting obstacles of serious magnitude on the French coast, since Calais is radically a bad port, while Boulogne is not far from being as unsuitable. The point selected by Mr. Fowler was at Andreelles, situated between Boulogne and Calais, where there is deep water, no sand, and ample shelter. This would reduce the distance from London to Paris by fourteen miles, and the time occupied on the journey by two hours. Whatever may be the choice, in the end, of public opinion, it is not likely that the saying of Captain Tyler will be permanently disregarded: "Frequently the traveller from India or America finds the British Channel the most unpleasant part of his transit, and he as often looks forward with more anxiety to the state of the Channel than to the heat of the Red Sea or the winds of the Atlantic." There can be no doubt concerning the absolute truth of this. But still more does it apply to the common passenger traffic across the Straits of Dover. The boats, as a rule, are confined, over-crowded, and ill-ventilated; women and children, in foul weather, are crammed into a cell, ironically called a cabin; the transport of merchandise is upon an equally unsatisfactory, if not discreditable, system; more is lost, in value, on the quays and wharfs than in hundreds of miles of railway carriage; and how long will it be before some alteration takes place? We leave the grander projects, for a moment, out of sight, to quote some details of that which has been found practicable elsewhere. Boden-See, or Lake Constance, is a fresh-water lake, about sixty miles long by about ten or twelve wide. It separates Austria, Wurtemberg, and Bavaria from Switzerland, and stops direct railway communication between Switzerland and those countries just as the British Channel does in the case of England and the Continent. "It was impossible to carry the railway round the lake, as the natural barrier which this forms is prolonged at its extremities by the impassable Alps"—impassable no longer, for this report was written some years ago. "Consequently, the goods traffic of Germany with Switzerland and the South of France, which is considerable, was exposed to delay by transshipment, to the great inconvenience of every one interested in it. Under these circumstances, Mr. Scott Russell, who

had built the first fast steamer navigating the Boden-See, was asked by the Swiss Railway Company whether he could undertake to design a vessel by which railway trains and locomotives could be carried across, with the understanding that no machinery of any kind should be required to put the trains on board, except the ordinary locomotive engine." His prompt answer was in the affirmative. There were two small and shallow harbours, allowing of no more than a six-foot draught. At each a structure was stationed for the traffic, nominally a ship, but answering all the purposes and having all the appearance of railway stations, with platforms, offices, and refreshment-room, double-decked, with two rudders, and independent paddle-wheels. The description goes on, the placing of the trains on board the ferry is a very simple operation. They are transferred by means of a bridge, suspended in the air by heavy weights, capable of adjustment to the rise and fall of the water, which, although it is a lake which is in question, has a periodical variation of about ten feet. Carriages intended to cross the lake are left at the siding, which leads to the ship; the locomotive which does the ordinary work of the station comes and pushes the train on board, and, once there, special precautions are ready to prevent its breaking loose, and the whole operation takes rather less than five minutes. It may reasonably be objected that Lake Constance is not the British Channel. It is not an enormously overcrowded maritime highway; it has no Atlantic billow and no heavy ground swell; but it has the short, sharp, chopping waves characteristic of the Dover Straits. Says Mr. Scott Russell, "the advantage of taking your bed-carriage in London, and not having to leave it until you awake in Paris, need not be enforced." Between the politicians who maintain that "the thin streak of sea-sickness" separating our island from France is our natural fortress, and the tourists who want it abolished, what can be said? For ourselves, we have nothing to do with the politicians, and trust that, in the long run, the engineers may decide the question among themselves.

NOTES ON CARPENTRY AND ON STRAINS IN STRUCTURES—IX.

IN a former number of this series of notes we gave an example of a roof of 50ft. span. Here is one of 90ft., also executed under the eye of the present writer. In so far as the parts of the two roofs are in common the details of this one are omitted, for they are the same as in the other one. The foot of the principal, for instance, is treated in exactly the same manner. This being a king-post roof the pressure of either strut is balanced by that of the other, or nearly so, and therefore needs no sinking bodily into the tie beam to resist a thrust, as a queen post does, but is simply tenoned into the tie beam. The heads of the principals are treated in a similar manner, in respect of shouldering and tenoning, to that we described for the other roof. The purlins are notched on to the principals in the same manner. The common rafters are also of the same scantling, and are, as in the other case, nailed to, but not notched on to the purlins. In other respects this roof is different to the other one, and in those respects we give the details as they were executed.

It will be seen that this roof partakes of the character of a mansard roof, inasmuch as it provides a floor within it. The floor, being 24ft. in width, is supported in the centre from below by a truss reaching from one line of principals to the next, and as the bearers which carry the ends of the joists (which are 9×3 , 18in. from centre to centre) are but $9 \times 4\frac{1}{2}$, with 15ft. bearing, they are supported intermediately at two points by an overhead truss with suspension rods. We need not encumber our space with details of the manner of joining these

pieces of timber, for they are the same as those given in the case of the warehouse floor in the last number of the BUILDING NEWS. We proceed to call attention to the manner of shouldering and tenoning the heads of the struts into the principals, Fig. 27. Here a square and solid bearing of an inch in depth is given to the strut, and a sufficient tenon to keep it in its place.

FIG. 24

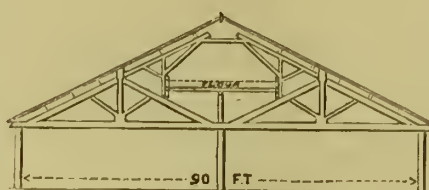


FIG. 25



FIG. 26

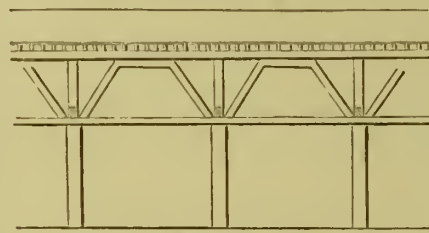
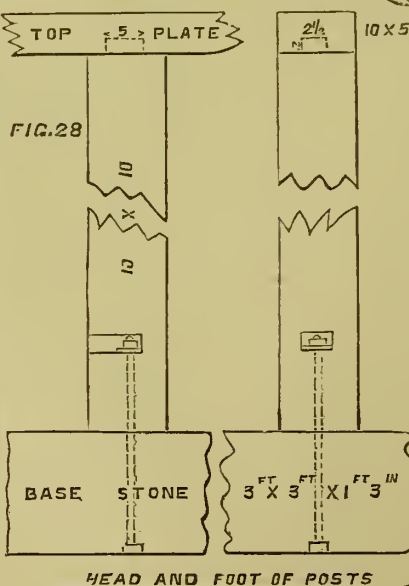
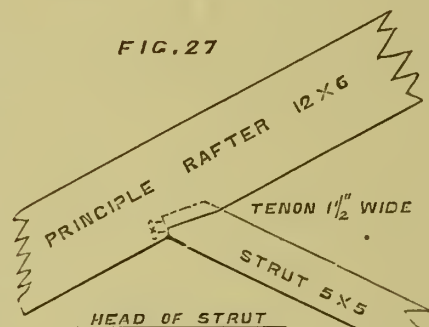


FIG. 27



In designing a structure the reverse operations occur to those which take place in building it. In the one place you begin with the foundations, in the other you begin at the top and design downwards. The weight to be carried is the first consideration, then its immediate supports, and afterwards in succe-

sion those which finally bring the weight to the ground, where a sufficiently solid foundation must be had. In this case the posts which carry the roof stand 15ft. apart longitudinally, and are set upon base stones 3ft. square and 15in. thick, which are bedded upon concrete 5ft. square and 2ft. thick, for the central line of posts, and 4ft. square and 1ft. thick for the outer lines. The posts are held down to the stone blocks by $\frac{3}{4}$ in. bolts, the heads of which are countersunk in the bed of the stone, and the nuts are applied by cutting away a mortice in the side of the post, the space left between the nut and the outside of the post being afterwards tightly filled with hard wood.

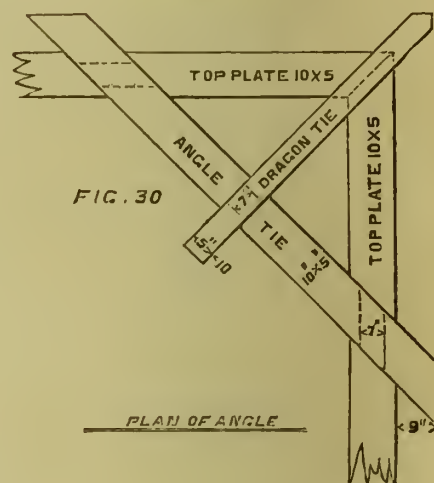
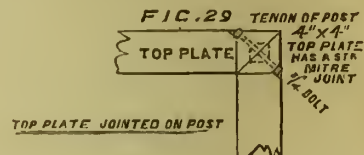


FIG. 31

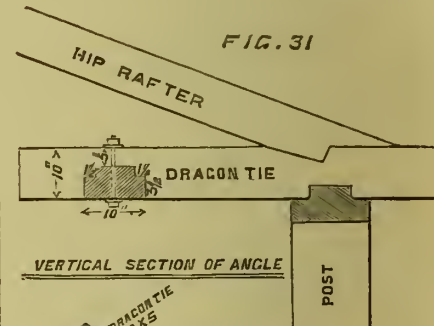


FIG. 32

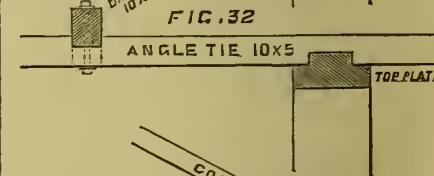
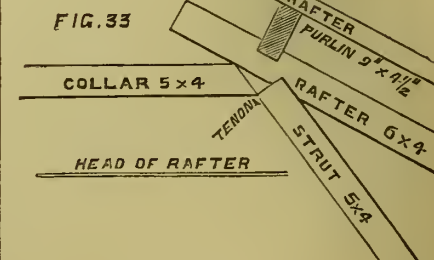
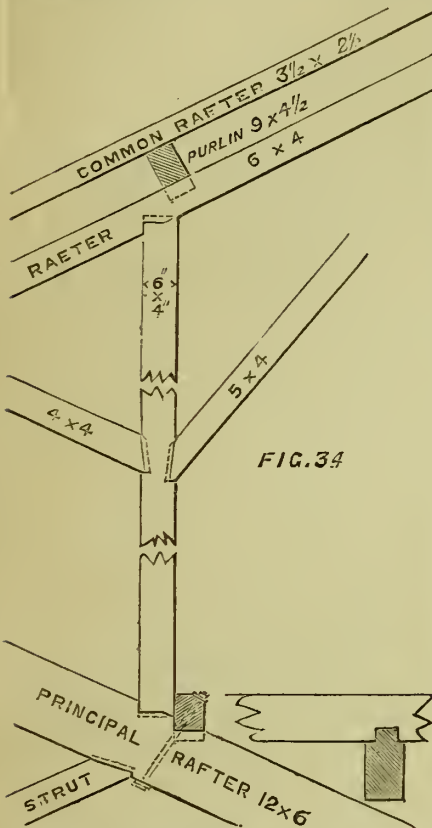


FIG. 33



The top plate, which runs round the building on the heads of the outer posts, and also along the central line, is 10×5 , mortised on to the heads of the posts 5in. long, $2\frac{1}{2}$ in. wide, and 2in. deep, the mortice being cut a little deeper than the length of the tenon, so that the bearing of the plate is on the head of the post, and not upon the end of the tenon. The tenon, therefore, must not be cut too large,

so as to reduce the strength of the end of the plate too much. In general, tenons should never take away more than one-third of the width of the wood; in this case the proportion is one-fourth, which is better; but the plate is wide, so that it fully allows a sufficient strength of tenon without greater reduction than this.



The hip rafters cannot well be managed without providing a support for the foot at the proper level. This is obtained by laying a dragon tie anglewise, directly under the line of the hip, one end resting on the top plate of the wall and the other upon a cross piece, or angle tie, laid to receive it.

In the upper part of the roof the collar rests upon the strut and abuts against the rafter. The end of the strut is cut with a bird's-mouth to receive the bearings of the collar and rafter, and is tenoned into the end of the collar.

We have not given this roof as an example of architectural beauty, for the outside aspect of so large a roof is ugly in the extreme; but if a few hints on framing are taken from the arrangement of the timbers and the manner of joining them, that will be an answer to our purpose. It will be seen that wherever a cross strain would be thrown upon a beam or post it is either balanced by an opposite pressure or supported from below.

The whole of the timber is Quebec red pine, except the common rafters, which are Petersburg red battens, ripped.

[ERRATA.—In column 1, on page 229, for 4 1/2 x 5 1/2 read 4 1/2 x 5 1/2; and in the table of comparative stiffness in the same column for "Memel fir 120," read "Memel fir 190."]

S. PAUL'S CATHEDRAL, PRESENT AND FUTURE.

AT a time when so much of all that is thoughtful in the way of art and architecture is expended in speculating and theorising about them, and when so very little is done in the way of adding materially to them, it becomes doubly interesting to watch over the remains of those of past times which yet exist. In London if there be one building more than another, the remains of the past, valuable and interesting to Londoners and Englishmen, it certainly is S. Paul's Cathedral. It is the central and most conspicuous of London buildings, and

as a specimen of Renaissance architecture, and a work of a great Englishman, it is not surpassed by any other building. It is, therefore, not a little interesting to ascertain what state it is in, and still more so to find out what is now going on in it in the way of repairs and "restoration," as it is called. We are compelled to say, shortly and simply, that what is now doing in S. Paul's in the way of restoration is altogether destructive, not to say absolutely ruinous, and it is some comfort to know that it was in the BUILDING NEWS that it was first endeavoured to point out the precise character of that destruction, and the momentous results involved in it. We did not anticipate at the time that many would agree with us in condemning the proposed position of the organ, or the rearrangement of the choir, or the destruction of the organ screen; but since we wrote, a protest against them has been published by one of the minor canons of the Cathedral, the Rev. J. Lupton, a gentleman of course well acquainted with the Cathedral and all that goes on in it. It cannot surely be waste of time or out of place to say a few more words on the proposed changes now actively going on, and on their meaning and certain effect. It is not too late to stay the mischief.

Let us again remind the reader—and he cannot too often call it to mind—that S. Paul's Cathedral was never designed and planned on a Protestant principle—i. e., that all in it should comfortably hear and see all that is to be heard or seen; but that it is simply a reproduction or copy of the cathedrals of the Middle Ages. The plan of S. Paul's is Gothic, and is fitted only—i. e., to utilise the whole of it—for the purposes to which the old cathedrals were put, every part of them being made use of, and serving a distinct and definite purpose. Wren's difficulty lay in building a structure which should be in all its parts useful; of course he failed, for from no one spot in the whole building can a human voice be heard or a man seen from everywhere and all over the building. It is the organ only that can make itself heard, and it is to the subject of the present position of that instrument and its division into two parts—it now being in course of building up—and to the destruction of the organ-screen, and the uses to which its parts are being put, that we propose to ask the reader's attention. It is not yet too late to mend matters, and to "restore" S. Paul's to its original state as Wren left it, and also to still further utilise it by a few reasonable alterations and additions, but without destroying any more of it. We would ask the reader who feels real interest in this matter to visit S. Paul's and test these matters for himself, bearing in mind the difficulties of the problem, and the fact that to completely utilise an old building, or to adapt it perfectly to a modern purpose, and one for which it was never built or planned, is a very difficult task indeed, and sometimes impossible. Mr. Lupton says, as we did, that the division of the organ into two parts, and its position as now determined on, will have in the future to be reconsidered, and that the time must come when the organ screen will come to be put back again into its old place and "restored," and, we may presume, the organ with it. No one can possibly doubt this who will be at the pains to study the subject a little, and to look attentively at the building and at what is in it. The difficulty, as we said, is doubtless very great for the quiet undemonstrative "services" of the national church do not admit of any very great latitude of expression. English nature is too dull to see a foreign idea of any kind, whether good or bad, and to make allowances for it. It is impossible to have everything just as one would wish, and to fully make a use of every part of S. Paul's it would be absolutely necessary to take a foreign idea, and to copy S. Peter's or some Continental church, wherein there are two or more distinct churches under one roof; indeed, to copy for that matter, and to

come nearer home, Westminster Abbey itself. Henry VII.'s chapel, now periodically used as a "morning chapel," and on special occasions, answers very well to the choir of S. Paul's; either of them are amply large enough for the ordinary week-day services. It is on Sundays, though not for "special evening services" only, that increased space is needful for a larger congregation, and for this purpose it is that the large area under the dome and the nave of the Cathedral is required. It is almost impossible to treat, or even comment on this important subject without going a little into matters theological. The old churches and cathedrals were built for an idea; modern churches are built first, and then the idea, whatever it may happen to be, is fitted into it, somehow or other! Here is the difficulty. There must be two altars in S. Paul's, one under the dome, somewhat, we should suppose, eastward of the centre of it, and one where it now is, in the semi-circular apse at the east end of the church. Thus there would be two churches under one roof, the organ-screen dividing them. But there are two churches in Westminster Abbey, and two altars and two pulpits, not to reckon the one in the nave, which is one of those compromising, make-shift arrangements which English people seem to delight in, and which merely says, "that is all we can possibly think of. There would also be two pulpits, as at present; but of course the one now under the dome—and which, by the way, is out of all harmony with the architecture of the building in which it is placed, would be further westward, so as to take in as large an oval of hearers as possible, itself standing in one of the foci. Such an arrangement would utilise the cathedral to the utmost possible extent—not wholly so, for that is impossible, for no one can hear the loudest and clearest of voices under the dome at the west door, or even at the transept doors. Of course we are supposing the organ-screen and organ replaced as they were left by the real architect, Sir C. Wren, and the clever organ builder, Bernard Smith, who really understood the cathedral better than Wren himself, for he it was, doubtless, who pointed out to Wren, who objected to the "box of whistles," the magnificent and unique effect of the accidental arrangement. Mr. Penrose, the present architect custode of this great church, seems to be completely lost in it; there is no knowing what will be pulled down next, or what on earth will be done with the pieces and fragments of timber and broken stone! S. Paul's now presents the most fearful scene of destruction and confusion of ideas that it is well possible to conceive, and one is at a loss to know which is most to be lamented, the pulling down and destruction of the old and useful work, or the senseless purposes to which they are afterwards applied; for what, may we ask—pray go and look at it—is the practical utility of the half of the organ-screen being fixed or attached to the northern transept doorway? It being all open, it does not even keep out the cold draughts, and anybody can see with half an eye, that it has been brought from somewhere else, and that it was never designed for the place it now disfigures. In passing we may ask why is the stonework just at this spot in course of being painted four coats of common oil colour! We would ask Mr. Penrose to pause for a few weeks, before it is too late, and reconsider the whole matter, and to map out in his mind what he really wants to do, and on what idea he is going to work. What a splendid opportunity there was for a few harmless experiments during the present temporary arrangements! A complete idea might have been realised with a few planks and yards of red cloth, and no harm done, if ever so extravagant and ever so wrong, and a truly glorious result if by chance, happy chance, right. Is it too late to miss it? We may presume that we are not speaking

without book when we assume that the monster organ now in the south transept, and which Sir C. Barry protested against, as well he might, as blocking up the whole architecture of it, is to come down again, and the supporting columns of rare marble, we may suppose, either buried away in the crypt or given to the contractor. It is melancholy indeed to think of all this waste of money and fine material, and to think at the same time of what might have been done with it if but an idea had been present on which to go to work, or at least a little reverence felt for the building itself as another man's work and a sacred place! After the preservation of the stonework and the evidences of the workmen's skill of past days our own special subject of comment was and is the position of the organ and the restoration of it and its supporting screen. Nothing, as we contended from the first, could surpass the musical effect of the old organ in its old place; nothing could be more happily placed, and the almost impossible feat of making a building a part of a fine musical instrument was in, truth, accomplished. If there is anything in all Europe comparable to it it must be a something to go and see and listen to and wonder at. We wish we could say that some little notion of it could be got at by listening to the present temporary organ, so awkwardly placed close to one of the supporting piers of the dome. Why not have made this organ moveable, so as to try the acoustical properties of S. Paul's, and test the best place for an organ in relation to the singers? We must not forget to remind the reader and the public who care for these things that nothing could be worse architecturally than the effect of the double organ reaching nearly to the roof, and so out of all proportion, as shown lately by a temporary scaffolding and canvas, dwarfing as it did the stalls, bishop's throne, and all else behind it, and hiding so much of the real architecture of the cathedral. Musically it must fail, as at Westminster, where so much has been lost by the dividing the organ into two, and which mistake even Mr. Scott now acknowledges to be a mistake, for he has publicly given up the "vista" theory, for which the change was made and the mischief done. A very long length of building like S. Paul's or Westminster grows in picturesqueness and sense of vastness by such an interruption as the organ and screen, so that there is nothing more that can be said in favour of the change made even by those who once advocated it, while everything else is against it and in favour of a real restoration. The restoration of S. Paul's! The glass, the mosaics, the stone-scraping and painting and decoration, as a matter of business, are all distinct subjects to which we hope to return.

C. B. A.

THEORY OF THE ARTS.

ARCHITECTURAL COMPOSITION.

IN our last paper the importance of "construction" was generally discussed as one of the primary qualifications of an architect, as well as being one of the chief elements in design. Its connection and dependence on form was also shown as determining the principal structural conditions of architecture. Indeed, it seems to naturally arise out of a consideration of the abstract ideas of form and magnitude of parts as applied to a building. Besides which, it is the first and most important step between the simple abstract and the complex and concrete in our inventive faculties. It is the first reasoning process of combining the inert ponderable material and the dynamic and imponderable properties of art in its higher form. At this step the inventive faculty is called into exercise, the powers of analysis and combination are here concerned in giving to the inert material the form, proportions, and connection required to give shape and expression to our ideas. If we were to conceive a

building composed entirely of one material, as a rock-cut temple, the effort to produce such a work would be limited to one of form, and if such a homogeneous material were also of a very compact and cohesive nature, the faculty of form merely would be the paramount one, admitting great latitude to mere fancy; in fact, such a work of art would rank little higher than a Chinese or Indian cut toy.

When we come to construct, we have in the simplest case (a structure composed of separate stones, for example, which is a trifle removed from the monolithic design just described) to combine or compose, to give to each part, for instance, its due size, position, shape, and connection, as the column and its entablature and superimposed weight, and further so to regulate and adjust the relative mass, weight, and tendency of each wall, column, roof, or vault, as to insure at least equilibrium, to prevent dislocation of parts. The marble temples of Greece afford us, in their simple columnar and trabeated construction the first architectural lesson properly so called, as distinguished from the first monolithic conception, the rock-cut or wooden originals of these works. As we pass from this simplest kind of construction, in which the homogeneous material has only to be studied, its properties, qualities, density and weight to be considered, to a structure of two or more materials, a far more complex problem presents itself; the faculty of combination requires a careful analysis of materials and forces in respect of the various circumstances of each, besides the judgment of combining these materials and adjusting the forces necessary to give each its proper and legitimate office and limits in the composite structure. The difficulty of doing this effectively is at once seen, when we consider the very different and opposite properties, in a physical sense, these materials possess. Thus we have stone—hard or loosely-compact concretions and granular, frangible; brick or burnt clays, much the same; wood, fibrous, tenacious, flexible; iron, hard, malleable, ductile. We have also substances of a plastic and glutinous nature, such as plasters, cements, and other tenacious compositions. All these materials have different densities, weights, and specific qualities, and behave themselves variously in construction under different temperatures and conditions. Combination of parts, therefore, does not fully express "construction" as used in its composite sense in building. In the lowest physical meaning construction embraces the exercise of many mental operations, as perception, analysis, comparison, &c. In a constructional light, then, we have to consider materials separately and combined; that is, every material used in a building must be looked at specifically as to its nature and properties, as well as its connection with others in the composite structure. This twofold aspect necessarily demands distinct and often antagonistic modes of treatment, especially where the materials are not concealed, but play an important part in the design, as for example, an open timber roof over a solid and homogeneous shell of stone. The most skilful contriver, when called upon to produce a degree of harmony in his structure, finds this difficulty often embarrassing, especially when economy imposes a limit as to quantity. Our Gothic ancestors, with a boundless supply of stone, met such by covering their finest churches with vaults of stone, even at the expense of external props, thereby concealing the roof proper or its timber framework. The ancients before them seemed to carry out this principle of homogeneity of material in their temples by beams or vaults of stone or brick. Thus, we find, the earliest architects evaded the disparity of different materials wherever practicable. Now, things are altered; we don't hide our timber roofs either with stone, brick, or plaster. Our brick and stone are not disguised, but we pride ourselves in them, and even when

iron enters into our construction we frequently show it, making these unlike materials parts of an integral design. This diversity of material has imposed upon us a problem which our predecessors never thought of—namely, the harmonical relationship of various materials. To accomplish this with any success seems to be the main difficulty our architects have to contend with, and the artistic antagonism between stone, and brick, and iron, for instance, seems to have been an insurmountable obstacle to the joint employment of these materials in constructive design. Where one or the other material enters largely, as in the case of an iron roof over a brick or stone building, the difficulty becomes increased, and an interblending of the two elements in a skilful manner is the only way to produce an agreeable combination. To investigate the approximate principles on which such relationship should exist, we must briefly consider first the forces each material is subject to, and its capability of resisting them effectually. There are, firstly, the chemical forces of Nature productive of disintegration or decay, climatic influences on stone, iron, zinc, timber, &c. The action of the atmosphere on inorganic bodies is often both chemical and mechanical, as in stone; thus we have the agents of moisture, frost, heat, and electric influences at work. It must be understood the atmosphere is normally composed of two gases—oxygen and nitrogen—but often contains other more insidious gases, as carbonic acid, sulphuric, and various other destructive agents. Further, these agents of destruction are most active under the influence of moisture and dryness, cold and heat, by the new combinations superinduced between the earthy bases and metals. The chemistry of building materials is, however, still imperfect, on account of the varying conditions of climate and the components of the materials themselves, so that a great inductive knowledge is required to establish any laws of their durability. Still, experience points to denseness as an essential quality, and it may be well said that decay is in proportion to the porosity of the stone, as in all stones disintegration of the particles is promoted mechanically by freezing water, or by the solution of the cementing ingredient, as in some of the limestones. The Bath, Caen, and Portland oolites illustrate this remark. Nitrification is another cause of decomposition—namely, the effect of nitrogen generated in the air combining with the soda existing in all sedimentary deposits as limestone. Another essential is to place stones on their natural quarry bed.

Again, with bricks and all burnt clay materials, excess of sand is productive of disintegration among the particles, while the chemical nature of the clays, and the degree of burning, are other important points. With limes and cements we have also chemical and mechanical forces at work which need to be carefully observed. The purer carbonates of lime are very soluble in water; hence the mortar produced, if much exposed to weather or moisture, is dissolved. The argillaceous limestones furnish on this account the best limes for damp situations.

G. H. G.

(To be continued.)

ON THE DECORATION OF S. PAUL'S CATHEDRAL.

THE last number of *Frazer's Magazine* contains an article on this question. The writer mainly supports Mr. Street's views, which have been commented upon in our columns. The following is the concluding portion of the article:—And touching the glass we would say a word in season. Three windows in the apse are already filled with glass of Munich design and manufacture, and we are told that the other three will shortly be similarly filled, though it is added that the committee do not consider the employment of Munich glass throughout the cathedral as a matter of course. We are thankful even for that qualifying statement. Almost immediately after the appearance of Mr. Broome's statement in the *Times*, there appeared in

the same paper (July 19) a letter strongly urging that, rather than complete the apse with glass of a bad school, the three present windows should be sacrificed to make way for something more in keeping with the true principles of coloured glass decoration. We must say that we more than concur in this opinion. Before writing these remarks we paid a visit to the cathedral to make a renewed and careful inspection of these windows, and our deliberate conviction is, that, granting the able drawing and composition of the figures (which some of our own glass-designers might well take a lesson from), these windows are, in all that concerns the special qualities of stained-glass design, as thoroughly bad in style as they can be. The colours are harsh and inharmonious; the employment of imitation *rococo* architectural details of the worst description as part of the design is heightened in its ill effect by the glaring yellow tone in which these are portrayed; the employment of perspective and background and attempted chiar-oscuro effect is at variance with the first principle of stained-glass design, which demands that the glass should be treated as what it is—viz., a plane surface for the transmission of light; and the design is produced, not by putting together pieces of glass into which the colour has been incorporated ('pot metal,' as it is termed), but by painting on the glass, which is not the true art of stained glass at all, and is more or less perishable. Stained glass, if made the medium for figure subjects, requires that these should be treated in a highly conventional manner, totally distinct from that which is proper to pictorial art, and without any attempt at perspective effect; otherwise the thing sinks to the vulgar level of a "transparency" picture. But it is now a question seriously asked by the best critics on the subject whether figure designs are really suitable to stained glass at all, owing to the difficulty of treating the outline of the figure with sufficient delicacy and correctness, and of avoiding absurd effects from the necessary crossing of the lead-lines over the figures. We are strongly inclined to the opinion that stained glass finds its true field in the elaboration of decorative colour design rather than in producing transparent pictures; and that if the enoplas, &c., of S. Paul's Cathedral are to be decorated with figure subjects, there is here a definite ground also for treating the windows differently, giving them a part of their own to play in the general design, instead of placing in them figure subjects shown by transmitted light to compete with and overpower the mural subjects which are shown only by reflected light (and not much of that). We should bargain also for delicate colouring, and not too much strong primary colour; not only on account of its obstructing the light, but also because strong colour in the windows always lessens the aerial perspective of a large building, and consequently detracts from its apparent size. But we hope to hear no more of Munich glass: the style is essentially a vicious one. The German architects and decorators, whatever their merits, have always been conspicuous for a want of perception of fitness in the treatment of material; nowhere so much so as in their stained glass, as evidenced not only in S. Paul's, but in sundry painful specimens which affront the eye of the spectator in the International Exhibition this year (in the Meyrick Gallery and elsewhere). We counsel the Committee to have nothing more to do with Munich glass; to rescind their order for the three new windows; and to consider whether there is not afforded in S. Paul's a very fine field for something entirely new in stained glass design, in the production of windows which shall display all the true principles of design, hitherto only illustrated in Gothic glass, but in a form and style suitable for the decoration of a Renaissance building.

There are one or two other points which seem to us most important to be borne in mind in the carrying out of any scheme of decoration in such a building as S. Paul's. First, as to the effect of large figure subjects on the scale of the building. Any one, we believe, who looks first at the spandrels of the dome which are yet untouched, and then turns the eye to either of the two which are now filled with mosaic pictures, will be conscious immediately that the apparent scale of the architecture is diminished by comparison with these figures of "heroic," if not colossal proportions. There is always this danger in the introduction of such figure subjects into a large building; and, on the other hand, there is no doubt that figures merely life size would at that height appear paltry. The dilemma is a difficult one; but, as one way of partially meeting it, we should propose that in future paintings of the same sort the background to the figures should not be, as in the two present designs, a plain expanse of gilding, but should be broken up into a conventional diaper ornament of small size,

formed by the repetition of some simple pattern which would give the eye a scale by which to estimate better the space covered by the figures, and consequently their real size. Every one may observe the effect which the old style of glazing windows in small lozenge lights has in giving a scale to a building, simply by the number of small parts into which the window area is divided; a plate-glass window always looks smaller in comparison; this will serve to illustrate our meaning. The treatment of the dome is another important point as affecting architectural scale and appearance. The difficulty in gaining the full effect of a dome as an internal feature lies in the fact that, in proportion to its height, it is always seen from below in foreshortened and diminished perspective, and consequently never looks its real size or height. The visitor to S. Paul's may convince himself of this by comparing the apparent size of the base of the dome above with the circle marked out below by the dark marble in the pavement, and he will be conscious how difficult it is to realise that the two circumferences are nearly the same;* and the height of the curve, too, is very much lost to the eye from below. Any decoration applied to the inner surface of the dome should therefore be so carried out as to add to its present height by the use of smaller parts and somewhat more delicate colouring towards the apex as compared with the base. The cupola "closing in a gold and azure glory" (to use the words of the secretary's letter) might, we fear, operate in bringing it down still nearer to the eye than at present; but of course this would depend in some degree on the treatment employed in the lower portion. The idea that the decoration of the dome must be divided into eight compartments, corresponding to the eight arches below, which seems to be generally entertained, is one to be received with caution. The dome is supported on an octagon, but is not octagonal, nor is its immediate substructure; it is a uniform hemisphere, and any such treatment as a strongly-pronounced division of it into eight vertical bands or stripes of decoration would in our opinion be most prejudicial to its grand unity of expression; and so far from being, as appears to be supposed, a constructive design, would in fact be a negation or falsification of the construction. Then we are told that the decoration must be of a "religious" character, and that the committee have consulted Mr. Burges, "an architect pre-eminent in his knowledge of ecclesiastical decoration," who has furnished a scheme or iconography of the arrangement of the figure subjects, which concurs very nearly with the previous intentions of the committee. We would say nothing in derogation of Mr. Burges's proficiency, and there is no doubt that his scheme (which we have had an opportunity of inspecting) does indicate a very extensive acquaintance with the conventional treatment and symbols of the equally conventional personages of ecclesiastical history. But most of us who pay any attention to such matters know pretty well what is generally intended by the term "ecclesiastical decoration," and that in the main it signifies stiff, mechanical-looking figures, with gold plates behind their heads. The only excuse for this kind of figure decoration in a Mediaeval cathedral—viz., that it is really the style in which the Mediaeval decorators did work, is cut away in the case of a Renaissance building like S. Paul's. There is no excuse for sham Mediaevalism here. We do not advocate, certainly, a return to the style of decoration in vogue in Wren's day, the taste of which was execrable. What we demand is, that the figure decoration shall be such as may appeal to our widest intellectual and artistic sympathies, instead of merely pandering to a narrow and degraded antiquarianism, and that it shall be carried out with all the knowledge of drawing and composition of which the best artists of the present day are masters, with of course just the necessary amount of severity of style and outline which mural decoration in mosaic or fresco demands. This is by no means impossible. A great many of Flaxman's outline designs, for example, are perfect models of style for mural decoration, so far as form and composition are concerned; but they have nothing whatever in common with Mediaeval stiffness or archaism. Mr. Burges's scheme, again, so far as we can gather, comprehends figures on three different scales, which, unless they are placed so that only

* They are not quite the same, as the pilasters under the base of the dome lean inwards slightly, following the line of the concealed cone which carries the lantern. This hanging inward of the pilasters has a very detrimental effect, and is one of the most serious among the faults of design to be found in S. Paul's.

† The same colours, gold and blue, have been employed in the recent decoration of the roof of the choir at Gloucester; the result is palpably to diminish the apparent height of the choir.

those on the same scale can be seen at the same time (which is barely possible), is a very doubtful arrangement. The committee, however, have not made their scheme public in detail, on the ground that they must have some security that the funds will be forthcoming before they go farther with it. This is surely putting the cart before the horse. They say, in effect, to the public, "Give us your money, and we will show you what we mean to do with it." The public will probably reply, "Show us your design, and we will tell you if we think it worth the money."

One other comment we wish to make, as to what may be termed the theological aspect of the matter. Fortunately we are not called upon to expound the logic of the concluding sentence of Mr. Broome's letter; but we must be permitted to point out that the committee, in addressing themselves to the general public for aid, are inviting subscriptions for what a large number of those invited will consider a serious anachronism. The scheme of decoration is to include it seems, a whole cycle of biblical and ecclesiastical miracles; not to speak of the Six Days' Creation, the nine Orders of Angels, Cherubim "full of eyes," Mediaeval saints with their appropriate symbols, and such other standard pieces of ecclesiastical furniture. If the committee have any idea of what is going on in the world, they ought to be aware that the majority of thinking persons among us regard these things as historically false and totally irrelevant to religion, and even to Christianity in its highest aspect. If they look on the cathedral as the property of churchmen to do as they please with, that is an intelligible position; but to advertise such a decorative programme as "a work recommending itself to no one class or creed" is simply ridiculous. They cannot reasonably expect support for such a scheme from any one outside the pale of their own communion, nor from many within it. If the committee wish the decoration of S. Paul's to be taken up as a national work, let them leave illustrating what many regard as mere fables, and turn to the broader and sublimer moral attributes of Christianity, the illustration of which, in various phases and through various actions, might furnish subjects of the highest order to thoughtful and original artists.* We have little hope, we admit, that this hint will be acted upon; the ecclesiastical amateurs, we fear, are too stiff in their own views, the ecclesiastical artists too nearly in the position of the silversmiths of Ephesus† to listen to reason on this topic. But if ever the scheme is carried out which is to convert our only Renaissance cathedral into a great storehouse of ecclesiastical "properties," we shall be able to say that in one quarter at least a protest was raised against the proposition to embody, in an imperishable material, histories and theories the actual truth and moral relevancy of which are at this very time becoming every day more and more widely questioned.

RAILWAYS IN NEW SOUTH WALES.—It appears that the cost of the line from Parramatta Junction to Picton, in New South Wales, 40 miles in length, was £667,241, giving an average of £16,681 per mile. From Picton to Goulburn, 81 miles, the outlay has been £1,022,628, giving an average of £12,628 per mile. Upon the line from Penrith to Bathurst, 109 miles, the amount expended was £1,572,342, giving an average of £15,746 per mile.

LABOUR FOR IRELAND.—An immense estate (the Martin) in the County of Connaught, Ireland, has changed hands—a domain as large as the whole County of Dublin—and the new proprietors, Sir Seymour Blane, Bart., and Captain Jervis, enter into possession on the 1st November, and intend at once making most extensive alterations and improvements that will require some thousands of more skilled workmen than can be produced in Ireland. At Roundstone, steam factories, churches, houses, schools, a railway, hotels for tourists, are immediately to be constructed, and some of our large contracting builders in London and Liverpool will most likely obtain the contracts. The spirited proprietors intend to divide the immense property into agricultural districts, to establish co-operative stores, to run coaches from Galway to all parts at a great expenditure. This will be the means of drawing away from London and the provinces a large amount of surplus labour of all descriptions at a high rate of wages. The estate in question is from end to end 44 miles in extent—the largest in Great Britain.

* We alluded just now to Flaxman. He can give us another hint here, for his series of designs called "Acts of Mercy," though not quite among his best artistically, suggest precisely the kind of ideal treatment we recommend.

† Acts xix., verses 24, 25.

SOUTHSEA BATHS AND ASSEMBLY-ROOMS.

A POPULAR but comparatively young watering place has just received a finishing stroke in the way of improvement, which enables it to be placed on a par with the older and better-known sea-side resorts in point of artificial convenience, as it already equals them in natural advantages. Indeed, but a few years since, Southsea had all the inherent advantages common to most watering places, but none of those conveniences without which it would be hopeless to expect visitors. It was within an easy distance of London, but had a very defective train service; with a splendid beach, bathing was next to impossible by reason of want of machiues; and so on, and on.

But gradually all this has been changed. The South Coast or South Western takes us down in a couple of hours; the shingly common has been levelled and turfed, and has a splendid esplanade along the whole length of the shore. These and many other improvements have almost entirely changed the aspect of the place, and now, within the last few months, an undertaking has just been accomplished which cannot fail of good results, both to itself and to Southsea.

The Southsea Baths and Assembly-rooms, to which we refer, and a plan and perspective view of which we illustrate this week, are situated at the extreme west of the common by the side of the new pier, directly facing the sea, and consist of buildings 326 feet in length in the Italian Swiss style. The War Department, on whose property the building was erected, restricted their lessees using either brick or stone in the construction, fearing that a too permanent class of building might, at some future time, possibly interfere with the general plan of the Portsmouth defences. Consequently, with the exception of the engine and boiler-house and water-tower, which are of brick, the whole of the baths and assembly-rooms are constructed of timber, rough cast outside, resting on four feet of brickwork, with a four feet layer of concrete under all, and are covered with an iron roof. The general effect of the buildings, notwithstanding this enforced paucity and poverty of materials, is satisfactory, while the plan and arrangements of the interior of the buildings are very skillfully contrived.

The extensive length of the structure is broken into three sections, and is flanked at one end by two lofty Belvidere towers, and at the other end by the water tower and engine chimney. The two end blocks are about 45ft. high, and the centre block about 50ft. high, each having an ornamental iron and glass skylight 4ft. high, with finials. The Belvidere towers have projecting slate roofs, and have balconies running round them, from which extensive views of the sea, the Isle of Wight, and the country inland can be obtained. So much for the exterior. If we were to make a suggestion, it would be that a light iron balcony or verandah should be added to the sea front, which now presents a somewhat bald appearance.

The means of ingress and egress are ample, there being entrances on nearly every side, the principal being at the esplanade end. This leads us to a spacious vestibule opening into the main assembly-room, which occupies nearly the whole of the eastern block, forming a fine saloon 80ft. long by 40ft. wide, with a minstrels' gallery at one end, below which are the vestibule and cloak-rooms. It has a number of French casement windows on either side, opening on to the croquet lawn, and to a terrace on the sea beach respectively. The wall-decoration of the inside of the assembly-room is somewhat Classic in treatment, buff and chocolate brown being the base colours, leading up to blue and white in the roof. This, combined with the open ironwork of the roof and skylight, produce a light and pleasant effect. From the iron roof hang down starlights at the intersections of the trusses.

Two wide passages lead us from the assembly-room to the central block, which comprises the ladies' swimming-bath, with a clear water space of 40ft. by 22ft. 6in., with dressing-boxes fitted up round the bath, a supper-room, billiard and smoking rooms, board-room, manager's apartments, and nine ladies' private baths, which are ranged round in a gallery above the swimming bath.

Lastly, coming to the other end block, we have a fine swimming-bath for gentlemen, being 70ft. long and 22ft. 6in. wide, in clear water space, and having a maximum depth of 7ft. and a minimum depth of 3ft. 6in. with dressing-boxes on either side, and with thirteen private baths arranged in a similar manner to the ladies', with lavatories, &c., attached.

The engine and boiler-house, engineer's apartments, laundry, and drying-closets occupy the extreme end of the buildings. All the baths can be

supplied with salt or fresh water, either hot or cold, and strained from all impurities at any time of the day and all through the year. The assembly-room, billiard-room, and corridors are heated by steam pipes, in coils or underneath the floors, and fresh air is introduced through the channels in which the coils are laid; there is communication all over the building by means of electric bells; and, indeed, we find everywhere that marked attention to details which goes so far to securing the success of a structure. There are two five-horse (nominal) engines, with three boilers which have been proved up to 100lb. pressure to the square inch.

The cost of the whole building complete, including engines, fitting, &c., is under £10,000, of which the engine-work generally (by Messrs. Gimson & Co., of Leicester) cost about £1,200. The gas-fittings, which are numerous, well placed, and in good taste, were manufactured by Messrs. D. Hulctt & Co., of High Holborn. Mr. Chevallier, of London, executed the decorations, and Messrs. Neave & Fry, contractors, of London and Ludport, took the general contract.

The whole of the works were carried out from the designs and under the superintendence of Messrs. Davis & Emanuel, 2, Finsbury-circus, City. Since the opening of the establishment it has been extensively used for swimming matches, concerts, fancy balls, and for public dinners and receptions.

THE REPARATION OF S. ALBAN'S ABBEY.

WE are very glad to hear, says the *Athenæum*, that not half the sum necessary for the "preservation" of S. Alban's Abbey Church has been collected, or even promised. The cause of so great a failure in subscriptions, a failure which is, of course, assumed to signify lack of public sympathy with the grand and historic edifice, might be hard to discover. We should be over-sanguine did we suppose that it is due to a growing sense of the irreparable mischief which, under the pretence of "restoration," has been effected in nearly every cathedral and great church in England, and in more than one in Scotland and in Ireland. Public disgust has not been aroused even by proceedings which have utterly ruined the most precious carvings on the front of Lincoln Minster, dealt so unfortunately with S. Patrick's, Dublin, and destroyed for ever so much that was venerable, if not for its art, at least for its associations. It appears that vast sums of money have been found for this and other, it may be less injurious, operations on churches in many districts. Worcester Cathedral will soon be quite "as good as new," and does but represent in an extreme manner what has been done all over England and France. The British craze for mere "tidiness" has been indulged under the pretence of love for art and honour for antiquity: the end of this is at hand, for there will soon be no more churches to spoil,—an end which was assured when once it was recognised that five per cent. on the outlay for such works was to be devoted to the architects employed. The cost of simply repairing and maintaining ancient edifices, which is all that artists and archaeologists wish for, and all that ought to have been done, would have been nothing compared with the operations which have yielded employment to many sorts of tradesmen. Fifty thousand pounds, the sum proposed to be expended on S. Alban's, has not been obtained. It is very hard to understand how such an enormous amount can be required for the mere preservation of the noble church: that half of £50,000, which is, we hear, available, ought, one cannot but think, to be amply sufficient. If, however, "restoration"—which means renovation,—is proposed, any sum of money might be expended.

THE NEW TOWNHALL, ROCHDALE.

THIS building, of which the foundation-stone was laid by Mr. John Bright, M.P., on March 31, 1866, was formally opened last week. The architect under whose superintendence and from whose design it has been constructed is Mr. W. H. Crossland, of Leeds and London. It is planned in three grand divisions, the two wings being at right angles with the principal building. This central part includes the exchange, lecture-room, grand staircase, large hall, and refreshment-rooms for public use on certain occasions. The east wing contains the town council-room, mayor's parlour, committee-rooms, and offices for the borough treasurer, surveyor, town clerk, rate collectors, and for other municipal purposes. The west wing is devoted to the magistrates and police, comprising a court-room, magistrates' rooms, police parade-room, dwelling for police superintendent, and prisoners' cells. The entrance to the central or public division of the building is

through the front porch into the exchange hall. This fine hall is 72ft. long by 39ft. wide. It is divided into three bays by polished marble columns, with richly-carved Bath stone caps and bases; its ceiling is vaulted and groined; its floor is laid with tiles of various devices, and its windows are of stained glass. Adjoining this hall are two rooms—one for the private use of the lecturer, when the hall above is occupied as a public lecture-room; the other for a ladies' cloak-room. Opening out of the exchange, and entered by an arcade of three arches, on group shafts, is a large staircase-hall, 40ft. by 34ft., divided by arcades into nine bays, having moulded columns supporting a vaulted ceiling. The staircase leads up to the large hall. This upper hall, with ladies' and gentlemen's retiring-rooms, cloak-rooms, refreshment-rooms, and offices, can, if required, be let off, not interfering with the rest of the building. The style adopted by the architect is of a similar character to that which obtained in England at the end of the fourteenth century, free use being made of mullioned windows of many lights. The hall is divided into seven equal bays, each lighted north and south by a three-light window, with rich tracery in the head. The stained glass designs in the windows represent the kings and queens of England. The roof is open-timbered, having hammer-beams with grotesque figures holding candelabra from the ends. The filling in of the roof is framed in square panels, plastered for decoration. Over the platform at the west end is a recessed organ-gallery, having a quadruple arcade, with stone shafts and foliated capitals, above which is a rose window of radiating tracery. The length of the hall, exclusive of the orchestra, is 90ft., and its breadth 60ft.; its height is 64ft., and it has sitting room for 1,200 persons. The council-room is spanned by four stone arches, the spandrels pierced with tracery. These arches support the ceiling, which is framed in square panels for decoration, as are the ceilings of the other large rooms. The council-room is 60ft. long and 24ft. wide. The works were carried out, from Mr. Crossland's design, by Messrs. Warburton Brothers, contractors, of Harpurhey, Manchester.

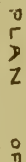
ASPHALTE IN THE CITY.

THE use of asphalt as a paving material finds increasing favour with the citizens of London. On Tuesday, at the meeting of the City Commissioners of Sewers, various memorials from public bodies and others were presented, urging the Commissioners to pave with asphalt various thoroughfares.

Wherever the gradients of a street admit of the experiment being adopted, the Commissioners seldom or never hesitate to give the asphalt a fair trial on being memorialised by the inhabitants; but it may still be said to be on probation. On Monday they were reluctantly obliged, on account of the gradients, to decline an application for its adoption from the trustees of Sir John Cass's Schools in George-street and Jewry-street, and also, for the same reason, one from the managers of the Royal Ophthalmic Hospital, in Blomfield-street. On the other hand, on the recommendation of the Streets Committee, they ordered that so much of the carriage-way in Threadneedle-street as lies east of the Val de Travers asphalt, laid down in 1869, be paved with the same material, at an estimated cost of £605, less the value of the old paving. They expressed an opinion, at the same time, that it was not as yet expedient to pave with asphalt the western part of that street, it being in good condition. The Commissioners resolved that the carriage-way in Cornhill throughout be laid with asphalt at an estimated cost of £3,096, less £415, the value of the old materials. They also resolved that the irregular-shaped area intervening between King William-street, Lombard-street, Cornhill, Priuces-street, and Threadneedle-street, be paved with the same material, at the estimated cost of £2,495, less £451, the value of the old stone. Mr. Ridley called attention to the slippery state of Cheapside from its being laid with asphalt to horses after a slight rain. Mr. J. T. Bedford, a member of the Streets Committee, argued on the other hand that not one horse in 3,000 fell at present in passing along Cheapside, and that as a rule fewer horses now fell there than before it was paved with asphalt. There was also the comparative freedom of a great thoroughfare from mud and noise. Mr. John Cotton complained of what he called the huge monopoly in the use in the City of the Val de Travers asphalt over that of the Limmer quality. Mr. J. T. Bedford replied that the Streets Committee had determined that there should be no monopoly, and that, on the contrary, they wished to try every system of paving, with a view to ascertain which was the best in all respects.

Rooms.

Phyco-graph. 77. Wrennan & Bass London



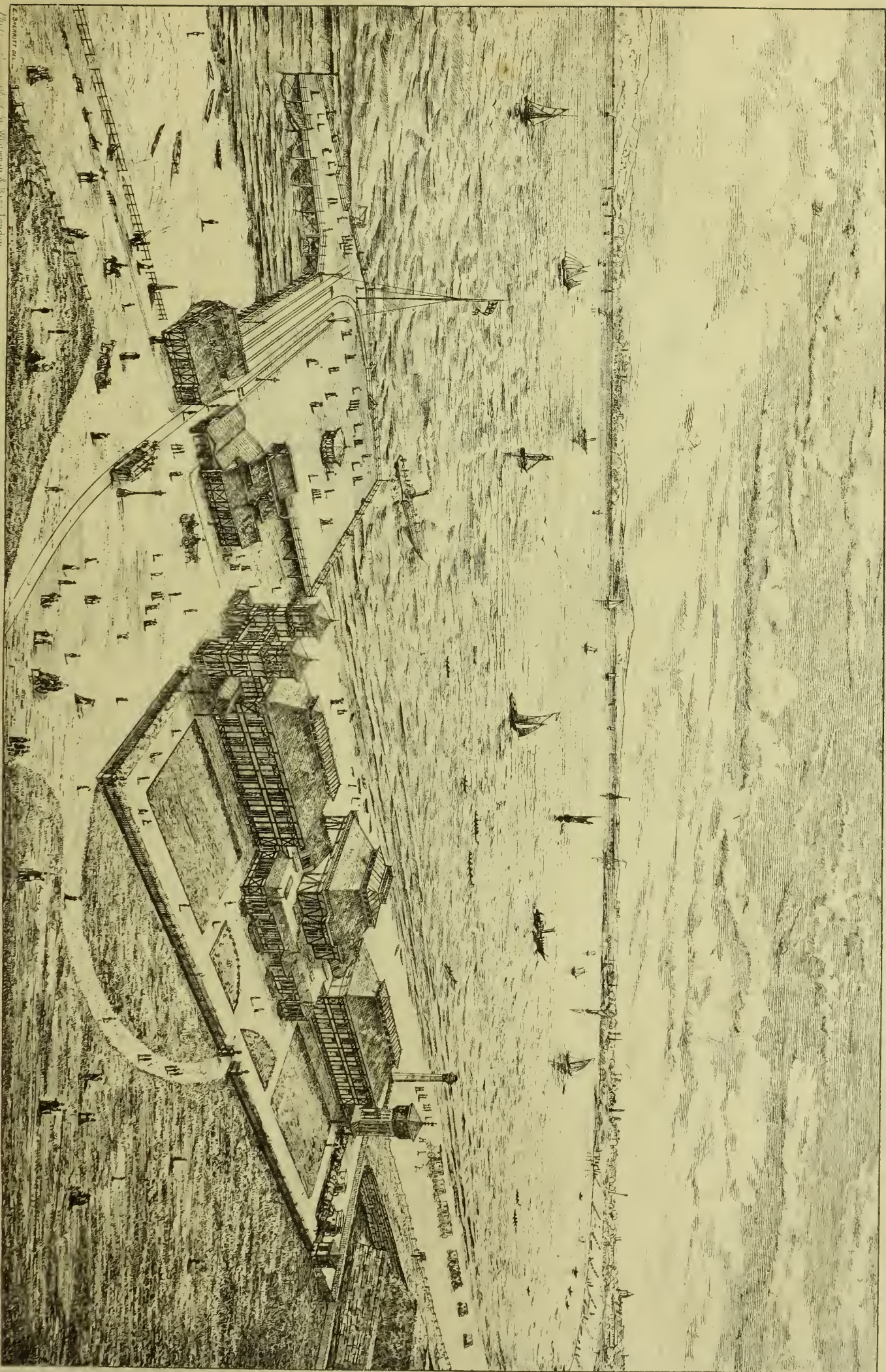
UPPER FLOOR



Scale 32 feet to an inch

Hand
for
Bathing Machines

The Pumping Pews Oct^r 6th 1877.



Printed and Published by W. Whitman & Sons, London.

SOUTHSEA BATHS & ASSEMBLY ROOMS — DAVIS & EMANUEL, ARCHTS

ART TEACHINGS OF THE INTERNATIONAL EXHIBITION.—II.

BY OMICRON.

PAINTING IN OIL AND WATER COLOURS.

THE supposed "habit of using water-pigments in the initiatory stages of their works," or of tempera concurrently with oil in any part of their works (except to the extent and in the mode already described), which Sir Coutts Lindsay attributes to "the earlier Venetians," and generally to the artists of the fourteenth century, is a pure matter of assumption. The question remains, did the Italian painters, Venetian or others, of a later period, use tempera and oil painting in combination; and if so, to what extent, and with what results?

It would require little argument to establish the probability that oil painting and tempera painting, being wholly distinct in respect of the materials employed, and the process of their application, could not be employed in combination with successful result; and all the records that history affords show that in actual practice, whenever the attempt was made, it has led to disappointment. In the very preparation of the ground the conditions of the two processes essentially differ. In tempera a process very similar to that in use with the ancient Egyptians, as seen in their mummy cases, was employed. The principal ingredients were generally chalk, or plaster of Paris, prepared with water or size, a composition which dried quickly and became brittle with age, and which, therefore, though well adapted for wood or other solid surfaces, was not equally applicable to canvas. As a consequence, upon the adoption of the latter material, although the size composition was, with others somewhat similar, still employed, it had to be laid on much thinner, to prevent its cracking when the texture of the canvas was disturbed by rolling or otherwise. Another defect in this preparation as applied to canvas was that it was liable to injury from damp. Mrs. Merrifield records a remarkable example of the disastrous consequences of the use of a tempera ground for a canvas picture, itself painted in oils, in the case of Paolo Veronese's celebrated "Nozze di Cana," which when transported, with other art-plunder of the first Napoleon's, to Paris, was found to be in such a dilapidated state as to render it necessary to line it with great care, in order to prevent it scaling entirely from the canvas. This operation, as satisfactorily accomplished as circumstances would allow, was hardly completed, when, in 1815, the picture was under orders to be restored to Venice, according to treaty. But now it was discovered that the colours crumbled off and fell into dust at the slightest movement. The consequence was that the picture had to remain in Paris, a picture by Lebrun being sent to Venice in exchange.

So much for the matter of grounding. In the process of colouring, the pigments are mixed in wholly dissimilar vehicles in the two processes; in the one, for instance, with water, yolk of egg, &c., in the other with oil—the one drying more quickly and with a harder texture than the other. To apply these heterogeneous processes one over the other would involve an obvious incongruity, and whenever it has been attempted it has led to failure. The two coats being of a different consistency, and with different capabilities of expansion, the harder being placed over the softer will crack, whilst the softer, superlying the harder, will be liable to shrivel up. The errors of commission of this sort amongst painters of the best schools, of the period immediately after the introduction of oil painting, are few, but are none the less worthy of record. In the Louvre are two pictures by Correggio of the "Triumph of Virtue" and "The Bondage of Vice," both painted in tempera on cloth. A repetition of the former is in the Doria Palace at Rome, which, according to Eastlake, is apparently painted partly in tempera and

partly in oil, and the colour of which is cracked and scaled off in various places.

Mrs. Merrifield, in her "Treatises on Painting," states that when in Italy, particularly in Venice, where the public collections were under process of so-called "restoration," she made frequent inquiries of artists, professors, and experts, as to the materials and processes employed by the old masters. Amongst other points she inquired about was as to whether oil and tempera had ever been used in common, and the answer she received completely negated that idea, with one slight and questionable exception. She asked Signor C. whether Titian had ever painted in tempera on his oil paintings, and the answer was "no"—no part of his pictures in oil was painted in tempera; he added that "Paolo Veronese, being aware that oil darkened colours, had employed tempera; but he did not know of any others who had done so;" mentioning particularly Bellini and Giorgione as not having done so.

But even in the case of Veronese it is doubtful from a comparison and full consideration of the evidences of the authorities consulted by Mrs. Merrifield, whether tempera was indeed used in combination with oil colours. It may be worth while to go a little into the matter. Mrs. Merrifield states that mention was made that Veronese was in the habit occasionally of introducing some metallic colours, as red lead, vermilion, white, &c., as overlays on oil paintings, by a process similar to that of tempera, but not in immediate contact with the oil coats, but encased, as it were, between two coats of varnish. One of Mrs. Merrifield's informants stated that as a consequence, in cleaning the picture, when the outer varnish was removed, the so-called tempera colours were found to be soluble in water. Another authority informed Mrs. Merrifield, from his own experience, that what people took for tempera painting on the pictures of Veronese was not really so. According to him, the first painting was executed in oil, and the part upon which the metallic colours, or others which darken with oil, were to be introduced were left until the surface was *tacky*, and then the metallic colours were applied, mixed with water only, after which, the water having evaporated, the metallic colours were left adhering to the surface of the picture. Surely, however, such contrivances as either of these, whatever the immediate ostensible result, is hardly to be called "painting." It should be recollected, however, that Paolo Veronese was the last of the masters who preceded the decline of Venetian art—if, indeed, it would not be more proper to say that the decline, which was rapid and startling, commenced with him. Titian, his great predecessor, never had recourse to trickery to secure his splendid glow of colour, which, be it added, contrary to the theory propounded by Sir Coutts Lindsay, was attained by the simple superposition of successive thin coats of transparent colour, laid on, at considerable intervals, upon a white ground (with rare exceptions)—a similar practice, by the way, to that adopted by Rubens and all the great colourists of the grand period of art, inasmuch that it is on record that the authenticity of a reputed Correggio was recently denied by the Academy of Parma because it was painted upon a red ground. The adoption of coloured and darkened grounds, and the *fa presto* style of "painting up" from the beginning throughout, were, indeed, the symptoms which preceded and announced the expiry of high art.

Before quitting this question let us cite one eminent master from among the moderns whose restless experimentalising in vehicles and varnishes was the ruin of many of his finest productions. Reynolds, who, as is well known, kept memoranda of the pigments, vehicles, and processes employed in his various works, thus describes the arcana adopted in the case of the portrait of Miss Kirkman, and the result, under date Oct. 2, 1792:—"Gum dr. et whiting, poi cerata, poi ovata,

poi verniciata—retouched. *Cracks.*" Here we have a blending of tempera and oil vehicles, with the addition of wax, and Eastlake remarks upon it:—"A picture begun with whiting and gum tragacanth, then covered successively with wax, white of egg, and varnish, could hardly escape cracking and separating."

Returning to Sir Coutts Lindsay's report, we find the writer, whilst selecting Mr. Walker for especial eulogy as the perpetrator of what we denounce as heresy in art, by the combination of oil and tempera vehicles, pronouncing this unsatisfactory opinion of the result, as a set-off to the advantages of "prismatic brilliancy and an internal light which has been very seldom attained by our English oil painters." We are told:—"On the other hand, the defects above noted as incidental to tempera are also visible; the surface of the painting is painfully broken and patched, there is an abruptness and want of gradation in the colour, and a harshness of transition in the *chiaro oscuro*, very detrimental to the complete beauty of the works." Perhaps, our distinguished *cognoscenti* is labouring altogether under a misconception, at least as relates to Mr. Walker, for he appends the remark:—"It is difficult, I acknowledge, to dissect Mr. Walker's method of painting, or to say whether he has, indeed, used tempera in the initiatory stages of his work." Let us hope he has not, and that his critic may be equally in error in his opinion of the effect of his pictures, as in his theory as to the mode of their production.

Evidently much ignorance exists, amongst painters and critics, of the very technics of art. Sir Francis Grant announced at the Academy banquet the other day that it was intended to appoint a professor of chemistry at the Academy for the purpose of teaching the right processes in the manufacture of colours. May we be allowed to suggest that colour-grinding might safely be left to those who make it their trade, and who have every reason to wish to do justice to their customers, and that the funds of the Academy would be much more usefully employed in adequately rewarding the services of a professor of painting, who would give sound and practical instruction in the mysteries of preparing grounds, laying on colours, &c.? It would be a pity if a short-sighted professional jealousy should interfere with the attainment of that maturity and community of practice which should pertain to any association of intelligences pretending to be termed a "school."

Sir Coutts Lindsay is not more fortunate in his notions of the art history of England than in that of the Venetian and other Italian Schools. Speaking of the Exhibition of 1862 he says, "the English gallery was graced with the finest productions of Hogarth, Reynolds, Gainsborough, Wilkie," &c., whom he styles "the fathers of British painting," and side by side with which were those of "their immediate descendants, such men as Lawrance, Turner, Maclise, Etty, Stanfield, Mulready," &c. There is surely a little confusion here in the relative positions of the "fathers" and their "immediate descendants." How, for instance, could Wilkie be the father of Lawrance, being as he was his junior by sixteen years, and succeeding him as he did in 1830 as painter in ordinary to the king; or of Turner, who was ten years his senior; or even of Etty, or Mulready, who were only one or two years his juniors? And why is no mention made of Wilson or of Constable as men who exercised considerable influence in the initiation of the British school of landscape? Sir Coutts, two pages on, pursues the subject thus, having reference to the men whom he has named as "the fathers of British painting":—"The small knot of masters who, flourishing in the latter half of the last century, gave existence to the modern school of painting in England, had little connection

with those painters who, under the influence of the school of Vandyck, practised their art in this country. They were all of them self-taught men."

Here are two assertions which we must examine a little in detail. In the first place, who were "those painters who, under the influence of the school of Vandyck, practised their art in this country" in the latter half of the last century? Vandyck died in December, 1641, more than six years before his royal patron, Charles I.; and during the Protectorate which followed the death of the latter, art was totally extinguished, and any influence which the example, rather than the "school," of Vandyck might have previously exercised was, as far as this country was concerned, rudely suppressed. Yet not altogether was the benefit of his example lost to us, though upon the restoration it came back at second hand, and through the medium of a new immigration of foreign artists, in the practice of two of whom traditions of the manner of Vandyck were retained. These were Lely, who had already been in England, under Charles I., where he emulated Vandyck and succeeded him, on his death, as court painter; and Gerard Soest, or Zoust, of whom Walpole tells us that he was much given to satin draperies, in which he imitated the manner of Jerburgh, "but enlarged his ideas on seeing Vandyck," and who painted, also, much in the style of Lely, of whom he was a rival. Nor must we omit to mention Kneller, another immigrant, and another of Lely's rivals, though not in the Vandyck style. The name of Soest is connected with some circumstances illustrating what we may term the pedigree of art which lead us to confront another of Sir Coutts's bold asseverations—namely, that "the small knot of masters" whom he has named as "the founders of the modern school of painting in England" were "all of them self-taught men." Such is by no means the case. To begin with Reynolds, because he is involved in the pedigree case of which we were speaking. Reynolds was for four years the pupil of Hudson (1701-1779), who was the pupil and son-in-law of Richardson (1665-1745), who was the pupil of Riley (1646-1691), who was the pupil of the said Soest. Again, and here another case of pedigree occurs, why start with Hogarth, as one of the fathers of English painting, ignoring altogether Thornhill, of whom he was the pupil and son-in-law? Though Hogarth by his genius was the creator of a style of his own, there is no doubt that the mastery of hand in drawing which he acquired under Thornhill mainly conduced to his success. Thornhill himself was not self-taught. Born in 1676 he came early to London to pursue his adopted art, when, as Pilkington informs us, his uncle, Dr. Sydenham, "supplied him with the means of studying under a middling painter," whose name, however, has not been recorded. As to Gainsborough, he was the pupil of Francis Hayman, and besides studied deeply the works of Rubens, Titian, and Vandyck, more particularly the last named, whom he greatly admired, and of some of whose works it is said he made copies "which might be taken for originals." So much for Sir Coutts's theory that the works of these "self-taught" men—and simply because they are self-taught—had "a stamp very unlike any art productions of their immediate predecessors," and "possessed a marvellous originality of purpose and variety of resource, although often cramped by an incompleteness, painfully evident, in the technical knowledge of their profession." Though not admitting the technical shortcomings here suggested of them, we must look to other causes than their being "self-taught" for the acknowledged influence these painters exercised upon the new revival of art in England. As to the other artists whom Sir Coutts names, Lawrence was chiefly self-taught, though he had some valuable instruction from Hoare. Turner had, besides

other instruction, valuable aid from Girtin. Stanfield was entirely self-taught, the rest were all Academy men. It would be interesting one of these days to inquire into the relative merits of artists indoctrinated in artists' studios and those who have enjoyed the advantages of an Academy education.

Having now ascertained how generally incompetent Sir Coutts Lindsay is for the task he has been induced to undertake, we need not trouble ourselves to confront any of his opinions upon matters of detail—to discuss with him whether "as a miniature painter of subjects Meissonnier has never been equalled," whether Mr. Faed's works are "conceived in the very spirit of Wilkie," whether Mr. Watts "holds to the earlier works of the Parthenon," whilst Mr. Leighton "attaches himself to the later Greek sculpture," nor the interesting problem how "men fitted for such an undertaking" as the decorations of the Houses of Parliament are to be "evoked at the demand of a Government." Certain it is that the Royal Commissioners, with Mr. Cole at their head, have failed to "evoke" a man qualified by natural gifts and education to afford the world useful instruction on the subject of the art of painting.

THE CHURCHES AND BUILDINGS OF NOTTINGHAM.

SOME interesting particulars respecting the churches and other public buildings of Nottingham, where the forthcoming Church Congress is to be held, are given by a correspondent of the *Guardian*.

The weak point of Nottingham is, according to the writer, its public buildings. Except one or two crumbling bastions in the precincts of the ruined Castle on the ruins of the old fortress, which was an Italian palazzo built at the close of the sixteenth century, it has no secular building that is not quite modern, and, architecturally speaking, utterly contemptible. If, however, there should ever arise a local magnate with sufficient patriotism and wealth, there should be open to him a splendid opportunity of remedying the defect; for if the block of buildings of which the Exchange forms a part were replaced by a really grand townhall and covered market, the reproach of the town would be effectually done away.

The church history of Nottingham may be very briefly stated. The great, but by no means "mother" church, is S. Mary's, a cruciform Perpendicular structure, occupying the site of a Norman building, of which some fragments have been found and used up again as old materials. A local antiquary (Mr. Thomas Close) is of opinion, judging from certain heraldic and other indications, that the architect of the nave, transept, and tower was no other than William of Wykeham. Whosoever the work, it is exceedingly good, and it is remarkable for its lightness and its vast extent of window surface. The chancel is also Perpendicular, and of fair proportions and design, but so thin and inornate as to suggest the idea that it represents the iron church of the period—a temporary arrangement till funds for a more worthy choir could be raised. When the incumbeancy passed into the hands of the late Archdeacon Wilkins, the church was in a state that would now be considered deplorable. The west front had been rebuilt in a sort of sham Classic; the greater part of the nave was used as an "ante-church"; the transepts and chancel were filled with huge pews and galleries, and there was a kind of Corinthian re-dos, in oak panel. Dr. Wilkins at length set about amending this; but his plans were most peculiar. The galleries were taken down and the nave pewed; but a stone screen was run across the entrance of the chancel, and a second altar erected in front of it, the chancel itself being used as a mortuary chapel. The reading-desk (facing east) was placed about half way down the central alley! The good Doctor and his curates were suddenly overtaken by a calamity which for a time seemed to undo all their labours. The central piers began to show such signs of weakness that the church had to be closed, and the tower hastily shored up. In sheer desperation an attempt was made to procure a church-rate; and on its failure Dr. Wilkins resigned, and was succeeded by the Rev. W. J. Brooks, an Evangelical of the strongest type. This gentleman rebuilt the faulty piers, and the west front, and generally restored the fabric, under the advice of Mr. Scott; but his ritual arrangements were not of the most orthodox character. He threw open the chancel, and, by a curious arrangement of

the pews, he contrived to make the edifice look all on one dead level, from east to west. The reverend gentleman also built several new churches. S. Peter's, an Early English building, and S. Nicholas, a brick post-Revolution church, were in the hands of rectors of the old-fashioned type. S. James, a proprietary chapel in the Gothic of 1818, and situated in the extra-parochial district of Standard-hill; S. Paul's, a Classic edifice, erected out of the thanksgiving million; and Holy Trinity, a miserable specimen of modern Early English, were all in Evangelical hands. The High Churchmen built S. John's.

To those who are about to revisit the town after an absence of eight or ten years, there is an unexpected pleasure in store for them at S. Mary's. One of Mr. Morse's restorations will afford every Nottingham man peculiar satisfaction. During Canon Brooks's "restoration," the ancient chancel stalls were ruthlessly torn down, cast out, and replaced by the meanest conceivable deal pews. They were, however, purchased by Mr. Wyatt and his choir, and may now be seen at Sneinton; but stalls of exactly the same pattern are now to be set up at S. Mary's. It would be unpardonable not to mention the new church of All Saints, which is remarkable both as being the only modern ecclesiastical building of much merit, and as having been erected by the munificence of a single benefactor, the late Mr. Wudley.

EXETER DIOCESAN ARCHITECTURAL SOCIETY.

A QUARTERLY meeting of this society was held in the College Hall on Thursday week, the Earl of Devon in the chair. The Rev. J. L. Fulford, hon. sec., read the report of the Committee. The document had reference to some church improvements, &c., effected in various parts of the Diocese, but chiefly referred to the work of restoration now being proceeded with at the Cathedral. We extract the following:—

It must be known to the members of the society generally that your committee have, from the beginning, regarded the work now making considerable progress in the cathedral church of the diocese as being one of very great importance, and attended with grave consequences. And they have now only to draw attention to the fact that from August, 1869, to March, 1871, six documents in the form of memorials and resolutions have been presented to the dean and chapter, and three letters have been addressed to Mr. Scott, the architect, on the then proposed and intended work of re-arranging and refitting the choir of the cathedral church. Most of these documents have already been recited either in full or in part in the reports of the committee, and will in due course appear in our Transactions.

The principle which your committee have in these several documents sought to defend is the distinctive uses of the choirs and the naves of our churches; a principle which this society has for more than twenty years continually advocated, and, where they could, have endeavoured to enforce; a principle, as your committee hold of paramount importance; one of ritual propriety and ecclesiastical order, which is now almost universally admitted and acted upon by the whole body of church architects, and generally recognised and observed by both clergy and laity.

The only difficulty that presented itself in carrying out this great principle of the cathedral church of this diocese was the existence of a high, close, and solid screen. But that difficulty, taken at its utmost value, your committee have held to be nothing more than a difficulty on antiquarian grounds—a difficulty caused by a mistaken necessity, as your committee have said again and again, for preserving intact an old feature of the church. An old feature of the church, your committee say, but it may be reasonably doubted whether an original one, in the sense of forming a part and parcel of the original design of the church as we now see it, with its many Second-Pointed or Decorated beauties. An old feature, indeed, which harmonised very well with the Mediaeval uses of the church; and which could not altogether destroy ritual propriety as long as there existed two altars in the nave beneath that screen, and placed on either side of the entrance to the enclosed choir. And though upon antiquarian grounds there may be found flaws in the arguments advanced or in the opinions expressed, which try to establish the originality of the screen—its originality as connected with the design of the whole fabric—yet the real question at issue is not what may be the precise or the probable date of the screen,—is not whether the whole, as it now stands, is or is not one design and one structure; but whether the choir and the nave shall practically be used as one church

or two. The question raised, in short, is not one of detail, but of principle—a principle that cannot be placed in the same scale with, or regarded in the same light as, beauty of detail or richness of ornament.

Since our last meeting considerable progress has been made in the work. The modern screen, the modern pavement, and the very late and meagre stall-work have been removed. The removal of the altar-screen has very much improved the interior effect of the building, considered independently of the main object and purpose for which it was raised. And this improved interior does suggest to many the most effective mode of treating the altar and the enrichments to be attached thereto. Many would like to see a rich baldachin encompassing the altar, with relatively low screens on the north and south of it. This method of treatment would, it is thought, give great dignity and importance just where they are most needed, and would, at the same time, as far as is concerned, even extend the area of the interior. The removal of the modern pavement has led to the discovery of the old altar foot-paces and steps, and an old tile-pavement. And behind the stall-work on the north and south sides a modern brick wall, pointed, was found, with a continuous oak-bond set therein, evidently for the purpose of attaching to the wall the back of the stall-work just removed. The fine pierced and battlemented cresting, which is known to all, rested upon this modern brickwork; but there is no evidence, it seems, to prove from whence it was obtained, or whether it did or did not originally serve the purpose to which it has been recently put. The removal of the return-stalls has brought to light a very rough unfinished wall, on the eastern face of the solid wood-screen. Whatsoever may have been the date of this work, it is quite clear that the lower portion of the present wall was built from the western side against something, probably the old stalls, for the western face of this wall is smooth and carefully finished, whilst the eastern face of the wall is of the roughest description possible. The mortar at the joints in many places proves that the masonry must have been worked against either some woodwork or stonework that is now destroyed. For this mortar used in many places was flattened on the present eastern surface of the wall, by coming, whilst wet and soft, in contact with some substance in front of it. The shafts of the western pier north and south of the choir arcade are of Purbeck marble, and finished like the other piers in the arcade; and they have their bases quite as carefully wrought and moulded. But the wall of rough masonry already named is worked without care against and around these Purbeck shafts and bases. In the upper part of the eastern face of this wall traces of a reddish-brown colour are to be seen.

By the removal of the woodwork on the centre of the eastern face of the screen a foliated arch was discovered, corresponding with the foliated arch near the stone staircases leading to the organ loft. The jamb of this archway has but one section in the moulding, which is wrought out of the square at the angle, and the joints of the masonry of the moulded jamb correspond for some distance north and south of the opening with the joints of the wall masonry.

In that portion of the rood-screen which projects into the nave beyond the line of the two western piers of the choir arcade, iron-bars, about $1\frac{1}{2}$ in. square, have been found arranged, your committee are informed, in the form shown on this plan. These bars are set into the piers of the choir north and south; they form an angle over the two central piers of the west front of the rood-screen, and at each angle, fastened with a pin joint, one bar descends perpendicularly towards the pier's west front of the screen, and another bar, placed horizontally, runs eastward and seems to tie the whole of the upper portion of the screen into the wall on its eastern or choir face.

Taking these points as they stand, it may be asked if the mass of masonry on the eastern face of the screen formed a portion of the founder's design of the choir. Is it likely that the Purbeck piers and the Purbeck vases of the shafts constituting those piers would have been carefully finished as they are? Would they have been very carefully wrought and then at once buried in a wall of rough masonry?

Again, it may be asked if this structure, many feet thick, from east to west, was ever intended to serve any purpose in reference to the stability of the building itself? Should we have found the piers of the arcade and the walls (they are two) of the screen structurally distinct? Would they not have been very carefully and very firmly banded together?

Again, it may be asked if the strikingly peculiar arrangement of the last two piers of the choir arcade,

north and south (the two sets of double piers as they may be designated), and the screen, as it now stands, formed one design, and originated with one designer? Would that method of treatment which now exists be the kind of treatment which might have been expected? Might we not, supposing the whole as one design, have expected to find a solid wall, instead of this set of double piers, with a respond pier, east and west, working in with the choir arcade on the one side and the transept arches on the other?

Again, it is known that Bishop Stapeldon, who was killed in 1326, "completed a gorgeous high altar of silver, with its canopy and matchless sedilia; and that Bishop Grandisson performed the dedication of the high altar in honour of Our Lady and the Apostles S. Peter and S. Paul, on 18th December, 1328; and that a contract was entered into in January, 1333, for the supply of Purbeck piers for the nave" (Dr. Oliver's "History of Exeter Cathedral"). The date of the completion of the choir is a settled point; the Norman Towers have been pierced and new windows inserted by Bishop Quivil, who died in 1291 (Dr. Oliver); the new work in the nave dates in its earliest stage with the entering into contract for piers; the extensive nature of the work proposed for execution prevented the possibility of its being completed for many years; but in the meanwhile the new choir is most certainly used for its many and constant offices. Both those who celebrated those offices and the furniture of the choir would need some protection whilst the new or the altered work progressed in the nave. This is found to be a necessity now. It was not less necessary when there was a high altar of silver in that recently finished choir. A wall built across the choir sufficiently strong to serve its purpose, and yet a wall of a temporary character, would have been but a natural way of meeting a present difficulty. Might not such an imaginary wall account for that, at any rate in part, which we now find on the eastern side of the present screen?

The colour-wash has been removed from the walls and groin vaulting of the lady chapel; and much progress has been made in cleaning the groining both of the aisles and choir. In the lady chapel, the spandrels of the groining consist partly of Freestone and partly of Thorverton stone. And, although there is a great contrast in colour, there seems to have been no attempt made to arrange the stones, as it regards their colour, or any definite plan. The beautiful boss, is, as it is well known, painted and gilt; and, as might have been expected, traces of colour have been found on the groin ribs. Decorators are now at work on the groin ribs renewing, your committee understand, the colour in accordance with the traces which were found on the removal of the wash.

The report was adopted. A statement read by Mr. Hayward showed that there was a balance in favour of the society of £52 16s. 10d.

Mr. R. M. Fulford read an interesting paper, accompanied by drawings, on a second visit to Brittany, after which the meeting separated.

THE METRIC SYSTEM FOR BUILDERS AND CONTRACTORS.

MR. LEONI LEVI, in a little work on the advantages of the metric system, shows the benefits its adoption would confer on mechanics, builders, and contractors. He shows that the extended substitution of iron for stone or timber has greatly changed the condition of labour. The old measures and their subdivisions were adapted to the wants of the times when they were established. But now, in metallic or other works, a much greater precision has become necessary; and, since the old measures have no such small divisions, it has been found necessary to create them. In Russia, for example, where the measure does not descend lower than $\frac{1}{2}$ or $\frac{1}{4}$ of a verhook, that is, 0.0055 millimetre, it became necessary to divide the sagene into thousand parts of two millimetres each. In England the inch is divided into eighths, sixteenths, and thirty-seconds for some purposes, and into tenths for others. It is a great advantage of the metric system in mechanical valuations that, if we know the specific gravity of an article, we may arrive at its weight by its volume. A cubic metre of water weighs one ton or 1,000 kilograms, and is also one kilolitre in capacity; therefore, if it were required to ascertain the weight of a mass of rock, measuring, say, six metres long by three metres wide and two metres deep, the product of these, 36, is at once the weight in tons, and also the contents in kilolitres of a vessel of water of these dimensions. Multiply this again by the specific gravity of the rock, and it will give at once the weight of the mass of that rock. How different in the imperial system. The inch has no simple decimal

relation to the pound weight. In ship-building, it is a special advantage to have an unit which bears an exact proportion to a ton of water. Neither the inch nor the foot gives any convenient fact in relation to it, for a ton of water consists of 35.955 cubic feet, and the long decimal fraction is so inconvenient that Mr. Scott Russell said he had been led to get rid of it by adding so much salt to the water as should make 35 cubic feet weigh exactly the ton. Another important advantage of the metric system is that it leaves less chance of error from the misreading of figures. Mr. Robinson, of the Atlas works, gave an illustration of this. Take the dimension of 1,325 millimetres, whether the decimal point is inserted after the figure or not, no mistake can arise in the operation of the workman, because 1325 are the same as 1m. 325mm. Suppose even that by accident the decimal point should be inserted after the 3, the difference between 13m. 250mm. and 1m. 325mm. would be so great that the mistake would be immediately manifest. But if, on the contrary, in the present system a careless draughtsman inserts the figure 12 instead of 1 foot 2, the difference of two inches is so small that probably no error would be detected; and every one using an English rule of 2 feet in length must have experienced the liability to mistake 1.7 for 17 inches, or 1.5 for 15 inches, the combination of the figures 1 and 7 and 1 and 5 causing confusion, when dimensions are hastily or carelessly taken. It is well known that in making engineering or mechanical drawings, plan-scales, being reductions of the natural sizes, are employed for the purpose of saving space and promoting convenience of transmission. At present these scales vary, according to the whim or convenience of mechanical draughtsmen, between $\frac{1}{8}$ in., $\frac{1}{2}$ in., 1 in., $1\frac{1}{2}$ in., and 3 inches to the foot; so that in measuring off the full size a considerable diversity of multiples must be used. If, on the other hand, the decimal system proposed were adopted, nothing would be easier than the reading of the full-size from the scale-drawing—1.50 representing either the full size of 1m. 50c., or 1 decim. 50mm., or 1c. 5mm., according to the scale of the drawing expressed upon it, the mere alteration of the position of the decimal point giving the desired full size on the scale dimension.

THEATRICAL ARCHITECTURE.

WHETHER a building may or may not influence the works produced within its walls, is (says the *Athenæum*, in the first of a series of articles on "Theatrical Architecture and Stage Mechanics") a difficult matter to resolve. Although scenic glory is not a necessary adjunct to dramatic excellence, this is no reason why a model theatre should not be pushed to the nearest possible point towards perfection, both as regards the comfort of actor and of audience, and the carrying out of an illusive picture, down to its remotest details. M. Garnier, architect of the new Opera house in Paris, has determined that his edifice shall answer all required qualifications, and though many may disapprove of his taste in external decoration, none will grudge him a thorough earnestness of purpose, as well as a profound acquaintance with his subject. The introduction of covered entrances for occupants of carriages to public buildings is but of recent date. Since the application of the principle, some sixty years ago, three systems only have been in general use—viz., a mode of entrance in connection with the façade, or by means of a subterranean roadway, or by application of porticoes on the sides of the edifice. The first of these methods is objectionable, as bringing foot-passengers in juxtaposition with carriage occupants. The second method, as employed at the Berliu and Turin theatres, and in the Italian Opera at Paris, is also objectionable, on account of the reverberation caused by the arrival of a string of vehicles beneath the feet of the audience. The space provided for this purpose at the Italian Opera of Paris has, indeed, been converted into a huge receptacle for stores. The third system, as employed in the recently-destroyed theatre at Dresden, is undeniably the best, as, besides keeping pedestrians and carriages apart from each other, it provides an architectural motive for adorning the blank side-walls with a semi-circular loggia, these walls having generally been left without relief to their native baldness. Such side-entrances may be placed either near the front of the house—i.e., at the extremities of the grand vestibule, or nearer the centre of the building. The latter of these arrangements is the best, for it is better that the separate crowds should not meet in the grand vestibule. It is impossible to lay down an arbitrary rule for the length of the covered carriage-way. M. Garnier has decided that his new Opera house shall be provided with one 30ft. in length, and he has so devised the approach and the imperial boxes and apartments on the grand tier as to avoid stairs or

lifts. This is effected by an inclined road of horse-shoe form, rising from the entrance of what may be called the outer territory of the opera to a culminating point at the private door in the centre of its arch, and as gradually declining again to the gate of egress, which is placed side by side with the gate of ingress. Thus all state paraphernalia are confined within an almost circular space, and cause no interference with the admission of the public to the building. It is essential to this arrangement, and to the provision of generally efficient means of ingress and egress, that the model theatre should stand in an open square or space, leaving a roadway all round it.

There are not many theatres in Paris, and none in London, which are fitly provided with vestibules. The new Opera at Paris possesses a double row of vestibules, running along the entire length of the façade: the first, a species of covered arcade open to the air; the second, a vast saloon, with folding doors leading to the grand staircase. For that portion of the public which drives to the side entrance a special waiting-room has been reserved, of huge dimensions and circular form, occupying, in fact, the entire space beneath the pit. There is also a large vestibule in connection with this circular one, for the use of servants.

M. Garnier considers a handsome staircase to be one of the most important items in the architectural success of a great theatre; and while ample care seems to have been taken to make this an important feature, it is gratifying to notice that several small but important matters of detail have not been neglected. Among other commendable features we are glad to notice that every door in the house will be made to open both ways (except those of the boxes, which will slide into the wall), so as to remove one great source of danger in case of sudden panic.

THE LIVERPOOL ARCHITECTURAL SOCIETY.

THE first meeting of the 24th session of this Society was held on Wednesday evening in the Royal Institution, Colquitt-street. Mr. H. H. Vale presided. Amongst the donations announced were drawings and photographs of "Ancient Irish Architecture," received from the author of the work, Mr. Arthur Hill, B.E.; and "The Styles of Architecture," by Mr. Edmund Street.

The President delivered his inaugural address, in the course of which he remarked that on assembling there that evening he felt it his first duty to refer to the lamented decease of their worthy and highly-esteemed Borough Engineer, Mr. James Newlands, to whose memory it was right that they should pay a fitting tribute. He was quite sure that all who had had occasion to meet Mr. Newlands had found him give a warm and cordial response in all professional matters when appealed to, and he ever exhibited a willingness to afford help and advice to every young member of the profession, and the mixed difficulties of their local Building Act he was always ready to remove. On private and public grounds he (the President) greatly regretted Mr. Newlands' comparatively early death, and he hoped that Liverpool might be successful in filling up the vacant post. He also had to express deep regret at the death of another gentleman who had been connected with their society, Mr. Lonsdale Miuhsull. In referring to architectural questions he said he considered that they could now foresee a period approaching when most of the great discoveries of practical science would become incorporated with the practice of architecture, and he was satisfied that all true architects would and must keep pace with the march of science and invention. The use of terra-cotta, of concrete, and of iron or zinc, in all their varied forms, should be advocated and advanced by them, as they were by the engineers both in this country and abroad. Inventive minds would not rest satisfied even with present progress, marvellous though that progress undoubtedly had been. He believed that the carrying of great spans of floor and ceiling entirely without beams and intermediate supports would be attempted, either by a web-work of iron and concrete together, or some system of self-supporting arches that would entirely supersede the use of iron pillars and girders, as at present adopted. In reference to local topics, Mr. Vale said the question of the health of the town had occupied much attention, and he felt that here, sooner or later, they must have a grand clearance of fever-breeding dens, and healthy dwellings erected upon the sites of the miserable hovels that now filled their courts and alleys. The reproach of having no annual exhibition of paintings here had at last been removed, mainly by the energy of their friend Mr. J. A. Pictou. The question of river approaches as an entire scheme still remained in abeyance, and the protest of Mr. James Holme against

the temporising policy would be endorsed by all who had carefully considered the subject. It was to be hoped, he said, that the Corporation plans for selling plots of land at the Sefton Park for building purposes would soon be completed, so that places of architectural beauty might be erected there. In the course of the address, Mr. Vale further touched on matters of architecture generally, referring to the Conference of Architects in London, to Continental architecture, and to the visit of the Society to Lancaster.

At the conclusion of the paper a hearty vote of thanks was accorded to Mr. Vale.

THE NATURAL HISTORY OF PAVING STONES.*

(Concluded from p. 231.)

NOW we want a theory that will fully explain all these things. We want a theory that will mix together rocks of all kinds, that will mix them up with clays and with sands, and with an endlessly varied set of materials. We want a theory that will make some of those rocks round and grooved and streaked. We want a theory that will explain why some rocks that are transported are as angular and as sharp as this specimen. In order to give you such a theory, I shall have to carry you half way across Europe. I will begin by taking you to Switzerland, and if you have as pleasant a voyage thither to-night as I had some months ago, I shall envy you the repetition of my enjoyment. Here is a photograph I took in one of the loveliest scenes in all Switzerland. Here you have the Mer de Glace, that great stream of ice which has been celebrated in almost all ages as one of the loveliest spots in Switzerland. The Mer de Glace belongs to that range of mountains of which the peak of Mont Blanc is the centre, and it is only a few miles away from that great mountain. This is a glacier. What do we mean by that? Those mountains which you see on all sides of the glacier are within the limits of perpetual snow; summer and winter, wherever there is a ledge upon which the snow can rest, it remains unmelted. This accumulation of the snow would in time entirely hide and bury the mountains, unless Nature had provided some way for getting rid of the surplus. She has provided such a way. The pressure of the snowy mass on the upper parts, forces the lower snow into the valleys. Then that snow, partly under the influence of the intense cold, and partly under the influence of the pressure to which the particles are subjected, becomes re-frozen, becomes consolidated, not into snow, but into a mass of solid ice; and by a wonderful series of changes, which my time will not allow me to explain, this icy mass flows down the valleys of these Alpine mountains, fitting itself to the various curves, to the widenings and narrowings of these valleys, almost as if it were a fluid. Indeed, so wonderful has been this peculiar power of the ice to adapt itself to the shape of the valleys, that the late Professor James Forbes, of Edinburgh, arrived at the conclusion that ice, hard as it appears to be when you are skating over it, must have possessed a certain property of viscosity, a certain kind of fluidity which enabled it to adapt itself to the various contours of the valley. Professor Tyndall, however, has given us a better explanation. He shows us that this downward steady movement is really accompanied by a crushing process, instantaneously followed in each atom by what he calls re-gelation, which means, in plain English, freezing over again. The point we have to deal with is not this re-gelation. We may take the movement of the glacier as an accepted fact. These glaciers move from the higher valleys into the lower ones at a very slow pace, but one which is capable of being measured. But what takes place as they do so? These magnificent mountain peaks, composed in this instance chiefly of granite, are being continually disintegrated by the cold of winter, by the rain, storms, and various atmospheric agencies that affect the surface of the globe. Huge fragments come tumbling down from above, and of course these fragments come from the ice. You will see running along here a band of rubbish that has fallen from above. You will see along here another band of rubbish that has fallen from above on the opposite side. The next photograph is one I took of the same spot in the immediate neighbourhood of what is called the moraine, or, in other words, this band of rubbish. Here you have the mountain slopes that we descended. We crossed over these huge rocks. Here you see the ice-slope which we had to climb in order to get upon the glacier. You see here what kind of materials the moraine consists of. The whole of this

mass of rubbish is resting, not upon the ground, but upon the ice, so that, as the ice moves, it carries all these rocks along with it, just as easily as you would carry your hat upon your head, and if it is one of the chimney-pot hats, I will venture to say, an enormous deal more easily. This is what is called a lateral moraine, one running down each side of the glacier. There are other moraines. The next photograph that I will show you is from another glacier in the Chamouni valley—another of the Mont Blanc glaciers; but it shows a different part of the glacier. This is a very instructive picture to those who have not visited the real scene. Here is the lowermost part of the ice; here is the cavern from which the water issues—there is always a torrent of water rushing down—and here we have what is called the terminal moraine. You will understand that when these masses of ice come down from the cold valleys above into the warm valleys below, the ice necessarily melts. Were it otherwise, those splendid scenes would become simply one sheet of polar ice. It melts, but the stones that it carries won't melt; consequently they have to stay there. As the ice melts, these stones drop down; and here you might almost imagine that you see them in the very act of dropping. These are stones that must have fallen almost the very day that I was there. Here is a glacier covered with ice; here are all the stones that form the moraine; here is the melting ice breaking off in blocks, and, as the ice breaks off and melts, the stones that break off with it tumble down as you see here. Now, you observe that in this way we have brought down to the lower valleys enormous quantities of material that lately had their home on the peaks of the mountains and in the valleys above. In this way we see that the glaciers not only receive from the mountains on each side immense masses of rock, but that they carry these masses of rock along with them down to the lower valleys. There is no doubt whatever that a very large quantity of material that we now find spread over the surface of the globe has been conveyed in this way.

But this alone would not account for the phenomena of our Manchester brick-fields. We want something more. We have evidence clear as the sun at noon-day that the material of which our Manchester brick-fields, and the brick-clays over a great part of the world, are similarly composed, have been brought thither by water. They have been deposited under water. We frequently find sea shells in them. We have the clearest evidence, I repeat, that these remains have been accumulated under the sea. Unless we can bring our glaciers in some way into contact with the ocean, our theory will not fulfil Professor Huxley's requisition—it won't "go upon all fours." Let us see if we can find proof of that contact.

We will now transfer ourselves from Switzerland to Smith's Sound, in the Polar regions. Here is a drawing I have copied from one of Dr. Kane's sketches. Here you have what is intended for the sea. If you saw it in daylight, it would be a proper sea green. Here you have the rocks and lofty cliffs that surround the part of the country in which the phenomena I am about to explain exist. In the extreme winter these masses of ice extend right across the Sound, from side to side. As the summer approaches, the central ice breaks up speedily, and floats away; but long belts of ice hold their ground around the coast for a considerable part of the year, and sometimes they fail to break away from one season to another. Now these blocks, or masses of ice, technically called "ice belts"—because they belt round the coast—receive masses of rock in precisely the same way as the glaciers did in Switzerland. Thus we see that these blocks of ice would carry away with them blocks of stone, if any circumstances occurred to detach the ice from the land. The detachments take place perpetually, and they carry away with them these blocks floating upon their surface. They are huge ice-rafts, which sail southwards, impelled by Arctic currents. But this is not all. We have some glaciers in these polar regions, of precisely the same nature as those of Switzerland; but, instead of the polar glaciers being comparatively diminutive—quarter or half a mile across—the great Humboldt glacier is fifty miles across, from one side to the other, and yet that Humboldt glacier, which comes right down into the sea, is bringing stones along with it in precisely the same way as the other glaciers. Now, with such prodigious masses of stone-covered ice as this existing in the northern seas, you will not wonder that from time to time icebergs of the most gigantic size are met with floating out of those northern bays and straits. Remember that what are called icebergs are merely either fragments of this belt of ice of these Arctic glaciers broken away, or portions of that huge mass of ice which in winter covers the

* By Professor WILLIAMSON, F.R.S. From "Science Lectures for the People."

whole of those regions—when you see that these ice formations exist on so gigantic a scale, you will not wonder that icebergs are met with in these seas, sometimes a mile in extent. If you realise that, when you have an iceberg of this size, it floats with its summits 200 or 300 feet above the sea, and that it sinks below the water some six or eight times its elevation, I think you will readily understand how that floating raft would be able to carry a very considerable slice of Penmaenmawr upon its surface! I have here a picture of one of these floating rafts copied from Dr. Kane's book. I have represented it as well as I could. Here you have the ice, which has upon its surface huge blocks of solid rock. This was sketched by Dr. Kane as he saw it floating away into the southern regions. It is an exaggerated example; we do not usually see the rocks so huge in proportion to the size of the raft, but it will give you an idea of the kind of transporting power these ice rafts have.

Now let us see how all this applies to English scenery. I have told you that the glacier moves steadily down the valley. You saw from the diagram that the glacier is cut up by deep fissures, called crevasses, that go down frequently to its very bottom. The stones that appear upon the surface of the glacier fall into these crevasses, and at the bottom they become entangled in considerable numbers in the solid ice. Many of them are angular. But you will also understand that if that vast mass of ice, filled with stones, is moving steadily downward over the rocks of which that valley consists, those stones will act like the teeth of a huge rasp; that they will plough, just in proportion to their size and sharpness and hardness, deep grooves in the rocks along which the ice is travelling. The stones themselves, being imbedded firmly in the ice, will scratch and scorch over the rocks over which they move; and this is precisely what we find that they do. Sometimes the ice retreats, leaving behind the smooth and polished rocks, over which it formerly travelled; the changes of the seasons frequently lead to its doing so; the glaciers not frequently recede up the valleys in hot seasons and come down again in cold ones. When the ice recedes we see that the rocks are scoured and grooved and polished in the way we should expect them to be. But if they receive this rough sort of treatment, what might we expect to be the result upon the teeth of the rasp? Workmen know perfectly well that when they use their files upon hard metal the angles get worn off. It has been so here. We could readily understand that if this stone was imbedded in the ice, and formed one of the teeth of our great Arctic rasp, that its surface might well be flattened and grooved with longitudinal grooves. Here, then, we have an agent capable of producing grooves. Then, if these icebergs float upon the ocean, carrying rocks with them, they will travel southwards, carried by currents, and, as they come into warmer regions they will share the fate of the Alpine glacier. Floating upon the sea does not save them; they melt little by little, and as they melt, the rubbish that they are supporting falls to the ground. The fact is, we have here a grand Arctic Limited Liability Carriage Company, and it is one in which the liabilities, in a financial sense, are at a minimum and exceedingly small, whilst the transporting power is at its maximum, or exceedingly great. If we were shareholders in a limited liability company, these would be just the results that we should like to attain to if we could. Inasmuch as the floating rafts cost nothing, it is of no consequence to the company that they melt, and that whatever they carry goes to the sea bottom. If they were bringing our trunks from the Arctic regions, we should find out the difference between them and a good old wooden ship. But they melt, and whatever they sustain, trunks or stones, goes to the bottom. The result is that large portions of the sea bed are being strewn over with blocks of stones—angular blocks, rounded blocks, sand, rubbish, every conceivable kind of produce that those northern mountains furnish is being gradually brought southward, and scattered over the bed of the Atlantic at the present day. And precisely similar phenomena were taking place during one of the latest of the geological periods when nearly the whole of our island was under the sea. There was a time, comparatively recent, geologically speaking, when our island was under the sea, but when the mountains of Wales and Scotland stood out like islets from the Arctic ocean. The great valleys of Snowdon were filled with these glaciers. If you go up the pass of Llanberis, you will see on every hand the indications of the fact in the rounded rocks, and in their scored surfaces, that abound on each side of the road. A little above the village you see them beautifully exhibited; and in the same way throughout in the district of which Snowdon is the centre, you have these indications of glacial action so numerous and so clear, that not

a shadow of a doubt remains that the Snowdonian valleys, as well as the valleys of Cumberland and Scotland, were, at the time of which I am speaking, filled with ice glaciers. Now all these glaciers—along with others coming from hundreds, not to say thousands of miles away, as well as from mountains in the immediate neighbourhood—brought their produce to the same bed of the ocean, and as it was all tumbled down into one common mass, you find materials in the shape of mud and sand as well as coarser materials, including both rounded and angular blocks, accumulated in the same sea bed. Now I think you will see that I have brought before you an explanation that fully accounts for the miscellaneous kind of admixtures that you find amongst the sand, and clay, and gravel beds, whether of a Manchester brick-field or of the coasts of Cumberland and Yorkshire.

Ladies and gentlemen, I have now finished my task. I have endeavoured, I trust not altogether unsuccessfully, to show you that in the natural world there are no objects, however common and familiar, that cannot reveal an interesting story, if we are but intelligent enough to question Nature in a right manner. Many of you are occupied with manufacturing pursuits, and from time to time your workshops receive the visits of strangers, who look with intelligent interest upon the processes in which you are engaged, and upon the final products of your labours. I invite you, in like manner, to visit Nature's workshop. She, too, is a fellow-labourer with yourselves; only, unlike you, she needs no rest, but works on, with untiring energy, day and night, summer and winter. She usually toils so noiselessly that few men know the vastness of the forces at her command. When we float idly upon a summer sea, or recline in some sheltered nook, watching the tranquil glories of a July sunset, we reckon little of the fearful energies that underlie the present calm. It is only when Nature rouses herself, like some angry lion, that men recognise her terrific powers. It is when the reeling earth is shaken by the earthquake, and cities crumble into dust; when the volcano belches forth its showers of ashes and streams of liquid fire, hiding the prostrated ruins from the eyes of men; when the flashing lightnings and the grand roll of the thunder inspire the stoutest hearts with wonder, not unmixed with awe; when the stormy ocean and the flooded river inundate the land, tossing man's proudest works, like playthings, from their surface, and hurling them to destruction, then it is that we learn something of Nature's power. Yet these forces, at times so terrible, are ever working out their Divine Creator's will and ministering to human wants. Study them and they will interest you; examine their products and they will repay you. You will then recognise the truth of the words which our greatest dramatist puts into the mouth of his banished duke, when he declares that there are

Tongues in trees, books in the running brooks,
Sermons in stones, and good in everything.

SCHOOLS OF ART.

ROCHDALE.—On Saturday week the annual meeting in connection with the Rochdale Government Science and Art classes was held in the Public Hall. The Mayor (Mr. G. L. Ashworth) presided. The report stated that the total number of students under instruction in Science was 138, and in Art 68. The total number of certificates obtained this session was 98 in Science and 18 in Art.

BELFAST.—The annual meeting of the friends and subscribers of the Belfast Government School of Art was held lately in the Institution, College-square, North, Mr. James Combe, J.P., in the chair. Mr. Shepherd, the secretary, read the first annual report and statement of accounts of the Board of Managers, made up to the 15th September, with the headmaster's report on the internal working of the school. The statement of accounts shows an outlay of £816 11s. 4d. in the necessary alterations and fittings of the building formerly used as a school of design. The general expenses, amounting to £384 7s. 2d., though heavy, were occasioned by the necessary outlay incident to the opening of the school. There is a balance of £372 2s. 8d. still to debit. The school, which was formally opened on October 17, 1870, has already attained a degree of success very gratifying to all its founders and friends. Upwards of 440 pupils have availed themselves of the advantages which it had placed within their reach, and it is pleasing to record that their progress has been such as to fully satisfy the Board and the authorities at Kensington. Though only a few months in operation, there were sent in by the various classes on the 9th of April last more than 1,500 works to the National Competition in London.

The Art Library in connection with the school is also in working order. To stimulate and encourage the pupils, and, if possible, to induce a larger attendance, the Board have instituted a special local prize fund, apart from the ordinary revenues of the school. It is intended to give at Christmas next the sum of £65 in prizes for original designs of various kinds. This is independent of, and additional to the awards bestowed by the Department of Science and Art. The Department has, on certain conditions, granted the sum of £300 for re-purpose of discharging the liability incurred in the constructing and refitting the building. Thanks are specially due to William Dunville, Esq., J.P., for his annual subscription of £100, which is chiefly intended to pay the rent of the school, and to the President of Queen's College, Belfast, for his prompt acquiescence on the request of the Board for the use of the available casts deposited in the College.—Mr. Thos. M. Lindsay, the head master, then read his report, in which he compared the work of the school with that accomplished by other and longer-established schools, and the comparison speaks very favourably for the Belfast school. Having stated the need of a local museum for the exhibition of all classes of art production, and particularly such as would bear upon the manufacture of the town, he insisted on the necessity of the art education of the masses of our people, if we would not be outstripped by other nations. Mr. Lindsay, in an appendix to his report, strongly deprecated the idea that students could produce anything of permanent worth except as the results of long and patient application.—Sir Chas. Lanyon, F.R.I.B.A., moved that the very satisfactory reports both of the Committee and head master, be received, adopted, and printed for circulation. He congratulated the subscribers on the flourishing condition of the school, and highly approved of that portion of the report of the head master which referred to the establishment of a local museum and local prizes. He thought it was very essential to the prosperity of the school to establish local prizes in connection with the staple trade of the neighbourhood, and he would be glad to assist in having these improvements carried out.—Dr. Moore seconded the motion, which was carried unanimously, and ten members of the Board having been re-elected, the proceedings terminated.

Building Intelligence.

CHURCHES AND CHAPELS.

ADDERBURY.—The parish church of Adderbury is being restored and enlarged. The gallery at the west end is to be removed, so that the arch which it blocked up may be opened and the principal entrance made from the western tower. The tower is to have a new oak floor above and a stone one beneath and a window over the door. Messrs. J. and T. Davis, of Banbury, are the contractors.

CHICHESTER CATHEDRAL.—The restoration is going on of the Lady Chapel of Chichester Cathedral, in memory of Bishop Gilbert, having been built by an earlier prelate of the same name, Gilbert de Sco Leofardo. The ante-chapel has been again thrown into the building, and reveals a lateral window (now closed up) like those of Chester and Hereford. The sedilia, laver, and aumbries are restored, and the stonework is renewed in the windows.

CLIFTON.—It is now nearly seven years since the foundation-stone of All Saints' Church, Clifton, was laid. Lately, however, great advances have been made, and it is anticipated that the date is not very distant when the temporary nave will give place to the permanent one, and the edifice be finished. A reredos will shortly be placed underneath the painted eastern window, the material from which it is to be fashioned being Caen stone, probably coloured. The nave, when completed, will be one of the largest in England, as its dimensions are 111 feet in length—five feet shorter than the new nave of the Cathedral—and 56 feet 4 inches in width. The chancel is 45 feet long; so from the east to west the church measures 156 feet; and the width of the chancel between the piers is 25 feet. There is a height of 43 feet 2 inches from the floor to the roof plate, while above that is the roof itself, ascending 18 feet additional. Mr. G. E. Street is the architect. Originally it was arranged to have the work undertaken in three contracts, but the number of independent contracts has since been increased to five. The first, for putting in the foundations and raising the building as high as the plinth, was let to Mr. Williams; the second, for carrying on the erection to the springing of the aisle windows, was undertaken by Messrs. Davis & Son, who are also executing the third, now in pro-

gress, and will probably have the supplemental contracts for completing the roof, paving the nave and aisles, &c. The walls are built of dry stone, and thoroughly grouted with mortar every six inches. The outer and inner course of stonework is built in mortar, but the heart is laid in dry stones, by which means the whole becomes thoroughly amalgamated. It is proposed to finish the stonework ready for roof-plate this year, if sufficient funds come in, the work now being completed from the springing of the lower aisle windows up as far as roof-plate high. The arches of the windows inside and those of the aisles are built with various-coloured stone—blue Pennant, red Mansfield, and Box ground in voussours being used. The whole of the interior of the edifice is to be paved with encaustic tiles. There is a side chapel and organ chamber, each about 18 feet wide. On each side of the nave are five arches resting on octagonal piers with carved capitals, and over every arch is a traceried three-light window in the clerestory, 15 feet by 9 feet.

DUFFRYN.—A new church at Duffryn, Neath, was consecrated by the Bishop of Llandaff on the 20th ult. The building is a regular type of the Welsh church of the twelfth century, with the old lychgate at the entrance to the churchyard. It is fitted up with open benches of varnished pine for 300 persons. The site was given, and the church built, at a cost of £3,500, by Mr. Howell Gwyn, of Duffryn.

HALLIWELL.—The opening of S. Luke's Church as a chapel-of-ease to S. Peter's, Halliwell, took place on Sunday week. The church is situated on the western side of Bolton, on the Chorley Old-road. The church has a lofty apsidal chancel, with a bell-fry over the chancel arch. The tower is not yet completed. The walls are mainly built of the rough rubble stone of the district, with quoins, arches, string-courses, &c., of red stock bricks; dressed ashlar is used in the heads and sills of the windows, and for tracery, cusping, &c. The roof is slated in bands and patterns of two colours, purple and green. The north-eastern view is the principal one. It takes in the three eastern apses, the gabled chancel aisle, the north aisle wall, the lofty clerestory, and the main north door. At the extreme south-west corner, and projecting to the west, is the baptistry, covered by a steep-pitched quadrilateral roof. The main entrance is by the north-western porch, the southern door of which opens directly into the nave, which is broad, lofty, and of five bays. The northern aisle has four bays and the southern five. The font is placed at the west end of the south aisle. The colouring of the walls internally is in two tints, in many places divided by a line of red brick. The ceilings between the stained roof timbers are coloured a pale gray tint. There are open wood parclores or screens between the chancel and chancel aisles. The chancel stalls are of pitch pine and walnut. The large apse window is filled with painted glass by Messrs. Lavers, Barraud, & Westlake. The baptistry windows are also by the same firm. The glazing generally is in varied patterns of the architect's design. The pews are of pitch pine. The heating apparatus is by Messrs. Haden. The church will accommodate 800 persons. The contract, which was taken by Messrs. Robinson & Son, of Hyde, amounts to about £4,200. The architects are Messrs. Medland and Henry Taylor, of Manchester.

KIRBY FLEETHAM.—The old parish church of Kirby is about to be restored, under the direction of Mr. Woodier, of Guildford. The foundation-stone of a new chancel was laid on Monday week.

LEVEN.—The new church of Leven United Presbyterian congregation was opened for public worship recently. The edifice is a plain building of freestone, neatly and substantially built, and capable of holding over 600 persons. The architect is Mr. Robert Baldy, Glasgow.

PAIGTON.—A public meeting was held last week at the townhall, to consider what steps should be taken for the restoration of the parish church. The committee, which had been appointed at a previous meeting, brought up a report, recommending the churchwardens to obtain a faculty from the bishop of the diocese, empowering them to remove the present seats on the ground floor of the nave and aisles, and to take down the galleries. They recommended, as a first step, the reseating of the ground floor, and removal of the organ gallery and pulpit, and the heating and lighting of the church; the remaining improvements to be proceeded with as funds would permit. £600 has already been collected.

STAMFORD-HILL.—A new Congregational church, which has just been erected at Stamford-hill, was opened on Wednesday. The building, which was designed by Messrs. Tarring & Sons, the architects, of Basinghall-street, and built by Messrs. Dove Brothers, contractors, is in the ornate style

of Gothic, and is constructed of Kentish ragstone, with Bath stone dressings. Its interior dimensions are 118ft. by 51ft. 6in. It consists of a nave, aisles, and galleries. There is a transept extending out at each side, and an apse at the eastern end, and it supplies seat accommodation for 1,380 persons. At the back there are public and other vestries, apartments for the chapel-keeper, a large lecture-hall capable of seating 300 people, a kitchen, and other accessories.

WARRINGTON, LANCASHIRE.—The restoration of Holy Trinity Church, which has long been needed, has now commenced. The committee, acting on the architect's advice, have decided to strip the roof of its present gray slating, to take down the ceiling with its enrichments (which have been much damaged by the settling of the timbers), to renew the stonework of parapet and cornice, and, should the funds permit, to renew the stonework throughout the building where decay has made it necessary. The restoration is being effected under the advice and superintendence of Mr. William Owen, of Warrington, architect.

WESTON.—S. John's Church, Weston, Bath, has been for some time past undergoing enlargement and rearrangement. The work was sufficiently advanced to admit of the reopening of the edifice last week. An apsidal chancel with five lancet lights in the apse has been built, which is divided from the nave by a chancel arch supported by two pillars with carved capitals. At the south side a transept, capable of accommodating seventy worshippers, has been erected. This is separated from the body of the church by two arches, springing from the central shaft. There is a small vestry at the east side of the transept, and at the other end of the building, on the same side, a spacious porch. The church has been newly seated throughout. Another great improvement has been effected in the lowering of the floor and the removal of the low pitched plaster ceiling. A handsome encaustic floor has been laid in the chancel by Maw & Co. The chancel screen is constructed of Bath stone, with Devonshire marble pillars. The reredos contains one of Salvati's mosaics. A groined roof, after an original design by Mr. E. Mercer, is an attractive feature of the church. The contractors were Mr. R. Mann (builder), Mr. E. Mercer (carpenter), Mr. Parham (ironmonger), Mr. S. Francis (glazier), Mr. Price (painter), and Messrs. C. J. Hurley & C. Abbey (carvers).

BUILDINGS.

BIDEFORD.—New Public Rooms have just been opened at Bideford. The music-hall and assembly-room is ninety feet by thirty-six, the ceiling being upwards of twenty-seven feet from the floor, and the style that of the Domestic Gothic. The roof is of the hammer-beam form, ceiled at the collars, with wrought woodwork beneath, and the ceiling is formed into panels by the collars, principals, and longitudinal ribs. The wall-pieces rest on detached shafts of red Mansfield stone, having carved caps and bases, and the cornices, as well as the niches of ventilation, are ornamentally worked. There are entrances by two flights of stairs to the orchestra and front seats, which, with the other staircase, allows of four exits. The doors, like the woodwork generally, are of pitch pine.

BOLTON.—The foundation-stone of Sunday schools about to be erected adjoining the Independent Methodist Chapel, Fold's-road, was laid on Saturday, the 23rd instant, by Mr. A. Winterburne, of Bolton. The estimated cost is £2,000, of which amount a moiety has been collected. Messrs. W. Burrows & Son are the contractors, and the architect Mr. James Lomax, of Bolton. The building is designed in an unostentatious style, the material being brick.

BRADFORD.—The Right Hon. W. E. Forster, M.P., opened the new Bradford Mechanics' Institute on Monday, the foundation-stone of which was laid by Lord Houghton. The building has been erected from designs by Messrs. Andrews & Pepper. The lecture-hall will comfortably seat 1,250 persons. The seating or stalls in the body are after the style of the Albert Hall. On the first upper floor, facing the Bowling-green, is arranged the library and reading-room, of lofty and ample dimensions—84ft. by 39ft. wide—divided longitudinally by scagliola columns into five bays, and the ceiling into panels, with enriched cornices and centre-pieces, at the rear of which is the lecture-hall. On the upper floors large, commodious, and well-arranged suites of class-rooms are provided, and also a great want will here be supplied by well-lighted rooms, suited for the exhibition of drawing models, casts, and other works of art, and forming at the same time drawing-rooms for the school of art in connection with the institute. There is also provided a small science lecture-hall, with laboratories, &c., to the same. The whole of the

building is fireproof. The scagliola columns in the reading-room are in imitation of verd-antique, by D. Dolan, Manchester. The carton-pierre decorations to gallery front are by Böckbinder, of London. The external appearance of the building is of the Italian style of architecture. The contractors who were intrusted with the carrying out of the works were:—For masons' and joiners' work, Messrs. Archibald Neill; ornamental ironwork, Messrs. Macfarlane, Glasgow; the clerk of works being Mr. R. Stewart. The land has cost £12,500, and the building a further sum of £20,000.

LONDON.—Messrs. Newman & Mann, of Peter's-hill, are rebuilding 43 and 44, Lombard-street, for Mr. J. Greenboam. The work, which is Italian in style, is being executed in Corsham Down stone, from plans prepared by Mr. W. Thompson, of 74, Old Broad-street. The property on which the house is being built belongs to two different ground landlords, so that though it is intended to have some of the rooms the whole length of the building, arrangements have had to be made for the insertion of a party wall should it ever become necessary to divide the building into two houses. This has been done by the insertion in each floor of riveted iron girders. The cost is estimated at about £3,065.

LONDON.—Messrs. Holland & Hannen, of Duke-street, Bloomsbury, are rebuilding and enlarging Messrs. Johnson, Matthey, & Co.'s gold and silver refinery, which extends from Hatton Garden back into Leather-lane, which was partially burnt down. The basement is fire-proof, and is spanned by riveted wrought-iron girders, supplied by Messrs. M. T. Shaw & Co., of Cannon-street, which are also used in the various floors throughout. In the roof is a large tank of cast-iron plates, with wrought-iron tie-bolts, capable of holding about 10,000 gallons of water. The floors also of the refinery are of iron plates, specially cast for the purpose. The work is being done from plans prepared by Mr. T. Piper.

MANCHESTER.—The first portion of the New Manchester Royal Exchange—nearly two-thirds of the whole of the intended building—has just been finished, and on Monday was thrown open for the use of subscribers, the Old Exchange having been closed on Saturday. There was no opening ceremony. When completed the room will be the largest covered room in the world used for secular purposes, and in its present state it affords 70 per cent. more accommodation than the Old Exchange. The old building was in the Doric style—the new one is in the Corinthian style—the principal features of the exterior being the octostyle portico of the main front towards Cross-street, and a large dome over the centre of the building. A lofty tower and spire will be built in the new portion which has yet to be erected.

WESTMINSTER.—No. 28, Bedford-street, Strand, is being rebuilt from designs by Messrs. Finch, Hill, & Paraire, by Messrs. Howard. The same firm are also building No. 22 and 23 in the same street, from the designs of Mr. A. Cross. The facing is of malmes, from Rydon, of Ball's-pond, with cement dressings. Parts of the ironwork are by Messrs. McFarlane & Co., of London and Glasgow. The slating is by Mr. Brindley, of Penryn Wharf, Bermondsey-wall.

STATUES, MEMORIALS, &c.

MEMORIAL TO THE LATE EARL OF CARLISLE.—A memorial to the late Earl of Carlisle was inaugurated at Morpeth on Monday, by Earl Grey. The memorial consists of a bust in marble, by Foley, and of a present worth about two hundred pounds, consisting of a telescope and microscope, and scientific books. The bust has been placed on the staircase of the Town Hall.

MONUMENT TO CARDINAL WISEMAN.—A monument in white marble was some time since erected over the grave of Cardinal Wiseman at Kensal Green. It has been executed by Messrs. Farmer & Brindley, of Westminster-road, from designs by Mr. Pugin. On the upper part of the tomb there is a recumbent figure of the Cardinal. On the sides are representations of scenes in his life. There is also a head of S. Charles Borromeo. Round the tomb an inscription is carved. On the foot of the tomb is the Cardinal's escutcheon, with the motto *Omnia pro Christo*.

BRISTOL EQUITABLE BUILDING SOCIETY.—The twenty-first annual meeting of the members of this society was held the other day. The report and balance-sheet showed that the total income of the society up to the 31st July last was £117,061 16s. 2d. A resolution was then unanimously carried authorising the directors to abolish the guarantee fund from July last, whereby the borrowers and investors would in effect have a bonus of about £800 between them, after appropriating £569 13s. 10d. towards future working expenses, and £1,000 to the reserve fund.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

RECEIVED.—F. S. S.—R. C. M.—T. C.—J. W. T.—T. R. U.—W. & Co.—Rev. C. B.—Labour.—W. E.—J. N.—W. N.—W. B.—H. G.—W. J. D.—J. R. D.—B. & Co.—J. J.—Cordes & Co.—W. T. E.—E. S. D.—C. B. A.—W. Y.

Correspondence.

PAVING STONES, &c.

To the Editor of the BUILDING NEWS.

SIR,—Wishing the public to be certain of the correctness of the articles which appear in your valuable journal, I take the opportunity of pointing out one or two slight errors I noticed in last week's BUILDING NEWS, hoping my fellow readers will do the same, where such occur in their particular locality, as it is better than laying the journal to one side, saying you cannot at all times depend on the correctness of these things.

First, I observe, from "The Natural History of Paving Stones," that Shap Fells is quoted as being in Cumberland. Shap Fells are in Westmoreland. The granite quarries are situated about four miles from the small town or village of Shap, and fourteen miles from Kendal, on the turnpike-roads, where, in former days, the London coaches passed daily, being the stormiest part of the road from London to Edinburgh. I am also well acquainted with the coast of Cumberland, but never noticed any granite similar to Shap granite on the coast. My opinion is that the granite boulders are either from Dalbeattie or the Isle of Man. It is also very similar to the granite at Dublin, from which place it is more likely to have come than from Shap.

In "Archeological" I notice the Cumberland and Westmoreland Antiquarian and Archeological Society called at "Brougham Castle. This should undoubtedly have been Brougham Castle. It is situated but a short distance from Brougham Hall, the country seat of the famous late Lord Brougham.

In reference to the paragraph in "Our Office Table" on eels in pipes, I noticed, about the beginning of July, and for several days, a vast quantity of small eels, plenty of them not larger than a tailor's needle, passing up the side of a small river. I counted them at the rate of about 100 a minute pass my stick on one side of the river only. As many more seemed to be going on the opposite side. The same had been noticed two or three years before.—I am, &c.

PRO BONO PUBLICO.

BLACKBURN FREE LIBRARY AND MUSEUM COMPETITION.

SIR,—No one, I should imagine, will doubt the truth of your correspondent's statement published in your issue of last week with regard to the above competition. It seems to me a *reductio ad absurdum* to restrict competitors to a certain cost, and then to select the very ones who most glaringly throw those restrictions totally on one side, and submit designs that will cost at least twice, nay, three times that stipulated cost; and I ask, what is to be binding, if the instructions issued by the very gentlemen requiring the building are not? Besides, it places competitors in such an extraordinary position, they neither know whether to keep the cost of their building according to the instructions, or to double or treble it; and certainly if competitions are to be conducted in this way, it would be far better to throw instructions to the wind; for if an honest man sends in a design kept within the prescribed cost, outsiders immediately imagine that he is incapable of anything more elaborate, and consequently his reputation, to a certain extent, is more or less at stake.

In conclusion, I most strenuously urge that the arbitrator, whoever he may be, should be made aware of the instructions, and if either of the eight chosen designs are held by him not to be capable of being executed for the cost named therein, that they should be immediately turned out, one then being chosen that can be carried out for the sum named in the instructions. This is the only fair way of proceeding, and if any other course is pursued, it will be most unfair to all.—I am, &c.,

H. F.

"DESIGN FOR COUNTRY RESIDENCE."

SIR,—As an anonymous correspondent in your last issue makes some remarks upon my design for a country residence, illustrated by you the previous week, and as his letter contains a number of blunders and misrepresentations, I must request your insertion of the following in reply.

Passing by such objections as that of placing the drawing-room upon the first floor—"a very questionable act," as he calls it, and I don't mind his calling it in question, and of making a feature of the stair, which is dependent upon the other—we find that "the kitchen is over 50ft. away from the dining-room." It is 45ft.—a very ordinary distance. What he calls "a dark passage" is lighted by two glass doors and three faulights.

I do not know what part of the country can boast of your correspondent's presence, but it seems to be the custom with him to have the table waited on by "fat and greasy cooks." If the destruction to "silk dresses and dress coats" were to be so enormous in the hall, I should think they would hardly escape in the dining-room.

It is not customary, as "H." asserts, to plan the doors so far from the corners as to admit of a chair being inserted. In a majority of cases this would be impossible, and in any case it would spoil the wall for any large piece of furniture.

Your correspondent asks "Where are the water-closets?" and tells us "nowhere!" The bath-rooms and water-closets are, as they ought to be, on the first and second floors. It is not necessary for me to contradict him, as he does so himself, and tells us (I shall say nothing about his bad grammar) that the water-closet for the main house is entered off one of the principal rooms. "One of the principal rooms," your readers will observe, is the cloak-room; but "H." has never heard of a water-closet in connection with a cloak-room. In this case it is lighted through the cloak-room, and ventilated over the ceiling of the scullery and passage—an arrangement common enough, but which your correspondent has never heard of.

Some of "H.'s" remarks are extremely fanciful, and indicate a vigorous and highly-developed imagination. He talks of the house being "scented from basement" (there is no basement) "to attic with sweet-smelling savours and spiced meats," and again of the house becoming "saturated with steam and effluvia, which, added to the scent of cooked meat, travelling where it listeth, render the whole house unhealthy." Now, as the kitchen and scullery are shut off from the rest of the house, and have a separate passage and entrance, we must suppose that the smells are intended to travel out by the back-door, round the house, and in again by the front. As this would only happen under very peculiar circumstances, I admit that I have not provided against it. I might have planned the house without a kitchen, but I could not have more completely isolated it than I have done.

"H." supposes that the washing would be accomplished in the scullery, and thinks that it might be attended with some inconveniences. If I had intended it for a washing-house I would have called it so. He might as well suppose the cooking to be performed in the parlour, or the dinner to be served up in one of the bed-rooms. The washing-house is intended to be detached from the main building.

Your correspondent is kind enough to say that "the roofs are greatly exaggerated in height." He does not say that they are too high for construction or for convenience, and he admits that it increases their beauty. But he says "they are greatly exaggerated in height." As I have not yet thoroughly mastered this piece of criticism, I shall not attempt to answer it. He has in his day, he tells us, designed open timber roofs, and he recommends for our adoption a pitch of about 45 degrees. Of all pitches possible this is the very ugliest, forming, as it does, a right angle at the ridge. If "H." will in future make a better use of his eyes he will find that, with scarcely an exception, all roofs with the slightest pretensions to beauty or fitness are either much higher or much lower than the pitch he has named.

As "H." is anxious to be informed where the bed-rooms are, I may mention that five large and seven of moderate size are provided for. If he does not understand the plan, he should have obtained the assistance of some friend to explain it to him, which would have saved himself, as well as his readers, some little trouble.—I am, &c.,

THOMAS LENNOX WATSON.

The Portsmouth Town Council had a scheme before them last week, by which it is proposed to extend the docks belonging to the Corporation, at a cost of £250,000. The project was referred to a Committee.

Intercommunication.

QUESTIONS.

[2325].—**Pump for Dairy.**—What material should the suction-pipe and pump be constructed of for use in a large dairy, where milk would daily require pumping from a large vat? Some material desirable that could be easily cleansed by having water passed through the pipe and pump when out of use.—T. P.

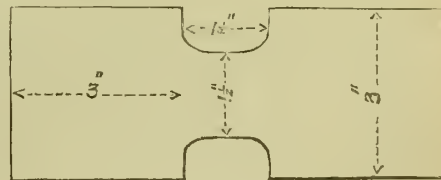
[2326].—**Principal and Interest.**—Can any reader give the formula to find the principal when the rate per cent. is given, with the gross amount of the interest and principal, thus:—A has £1,462, which is the principal, and 17 per cent. upon it. Query—What was the principal? We know if we take 17 per cent. discount from £1,462 we reduce that sum to £1,213 8s. 6½d.; but if we put 17 per cent. upon £1,213 8s. 6½d. it will only amount to £1,419 5s. 10d.—£ s. d.

[2327].—**Voluntary Architectural Examination.**—Will any reader kindly inform me as to the nature of the above Examination, and where I could obtain any of the papers of examination that have already been used, together with all the particulars?—**AMBITION.**—[Write to Secretary, Royal Institute of British Architects, 9, Conduit-street, Regent-street, W.—Ed. B. N.]

[2328].—**Architects' Charges.**—Can any of your professional readers give me the benefit of their experience in the following case? An architect is called in to prepare sketches for alterations and additions to a building in which a certain amount of additional accommodation is a *sine qua non*. An approximate estimate is given, and the sketches are approved by the client. The architect is then instructed to prepare working drawings, and to get out the quantities. This done, estimates are obtained from several respectable builders, and the lowest tender is found to be in excess of the approximate estimate. Ways and means are discussed, and certain deductions made as requested; but the plans are subsequently abandoned. The work is at once put into the hands of a builder, who prepares his own plans and specifications for a totally different scheme, and the work proceeds. The architect sends in his account, charging 2½ per cent. for quantities, and 1½ per cent. for drawings, each charge being calculated on the lowest tender. The client refuses payment except on the approximate estimate. The architect wants to know what he can justly claim.—A. H.

REPLIES.

[2321].—**Cement Test.**—A machine to test the tensile strength of cement requires to be so constructed that the strain on the cement block shall be equally distributed, and also that it should be so gradually applied as not to cause the least vibration or movement, and these requirements are not attainable by the machine your correspondent proposes to adopt. The Metropolitan Board of Works use one made on the principle of the lever-balance, and which effectually answers the purposes for which it is intended, and similar machines by the same maker (Mr. Adie) can now be obtained for about £20. When cement is guaranteed by the manufacturers to stand a certain tensile strain, it is better to use one of these machines, as you then get moulds of an exact size and other appliances necessary; and, in fact, where important work is being done, it is well to be guided in the quality of the cement supplied by the conditions laid down by the Board of Works, and make the manufacturers supply it on those conditions. The Board of Works made many experiments as to the form of cement block, and that which was ultimately considered best, and which is now used, is of this shape, and a



parallel thickness of 1½ in., and their specifications require that the cement "shall weigh not less than 112lb. per struck bushel, and capable of maintaining a breaking-weight of 350lb. per square inch seven days after being made in the mould, and immersed in water during the interval of seven days." The block, as here shown, should therefore maintain a strain of 787½lb.; but this is a very severe test, and it is doubtful whether advantages in other respects are not lessened in manufacturing cement to withstand so severe a trial. I may mention that I tried several of the principal London mathematical instrument makers, but found none but the one mentioned who made cement-testing machines.—T. P.

[2323].—**Paperhangers' Canvas.**—The canvas should be put on wet, and stretched moderately tight, but wetted before the paper is put on, and both can dry together. When wet, the canvas is contracted, and paper damped expands, each recovering its normal condition as it dries. If the canvas is sized, the wetting might be dispensed with.—G. M.

Our Office Table.

FARRINGTON MARKET.—At a meeting of salesmen and others connected with Farringdon Market, held on Friday last, the following resolution was carried, on the motion of Mr. James Phillips, seconded by Mr. Alfred Frisby:—"Having seen a report in the *City Press* that the Committee appointed by the wardmote of Farringdon Without to consider the subject of Farringdon Market propose to recommend to the wardmote the retention of the market on its present site, the Market Association can but express its surprise at such a decision, since, if reconstructed on the plan submitted by the Markets Committee, not only would the market be enclosed on three sides, but on the only remaining side the approach would be by three narrow openings; it would also be cut off from all railway communication; and the Association agrees with the expressive language of the *Times*—that if the railway cannot be brought to the market, the market ought to be taken to the railway." It was also resolved that the meeting should ask the wardmote committee to reconsider its decision in favour of recommending to the Court of Common Council the retention of the market on its present site. It was stated during the proceedings that the wardmote committee, while it numbered 28 members, comprised only four tenants of the market, whereas 44 of the present occupiers of the market were in favour of the removal.

SPECULATIVE BUILDING IN SOUTH LONDON.—Houses are being run up so quickly in the neighbourhood of Peckham that the supply is at present greater than the demand, and the landlords of some of the occupied houses, unsolicited by their tenants, are lowering the rents 10 and 15 per cent. In a new road, lately built in another South London suburb, the houses in which let at £42 and £55 per annum, the scaffolding had not been removed three weeks when, a rather stiff gale springing up, a length of cornice extending continuously along the tops of eight houses was blown down. This shows the nature of the workmanship and materials. To have inspected the houses in this road while in progress, and to have observed the very indifferent materials used, and then to have gone over the houses when "finished," in all the glory of plaster, paper, and varnish, would be quite sufficient to impress upon every one not yet aware of it, that generally, buying a new house is tantamount to buying "a pig in a poke."

CLOSING OF THE INTERNATIONAL EXHIBITION.—The Exhibition of 1871 closed on Saturday with the singing of the National Anthem by Mr. Land's glee party. The number of visitors was by season tickets 1,495; on payment of 1s., 14,605; total, 16,100. The total number of admissions since its opening in May was 1,142,154. At a lecture delivered in the Albert Hall, it was stated that the greatest number of visitors was on Whit Monday, when 21,946 passed the turnstiles, and the smallest on the 18th of August, when there were only 5,400. There had not been a single case of wilful injury to pictures, marble, or textile, or an instance of misconduct calling for the intervention of the police. After all expenses the receipts of the season would leave a balance of somewhere about £30,000.

TUNNELLING THE CLYDE.—The idea of a tunnel beneath the Clyde seems to be taken up with such spirit as to promise well for its speedy fulfilment. There is now a report of a second scheme for tunnelling the river, promoted by several engineers in Glasgow, and for which plans have already been prepared by Messrs. Storey & Smith, of West Regent-street. This project is intended to embrace both carriage and footway, whereas the tunnel projected by Mr. Deas, the engineer to the Clyde Navigation Trustees, is proposed to be used for passenger traffic only.

EPPING FOREST.—On Wednesday, the 27th ult., Vice-Chancellor Wickens, the vacation judge, granted an injunction, on the application of the Commissioners of Sewers of the City of London, restraining Mr. Johnson, of Lake House, from proceeding to plough up the Great Avenue at Wanstead, being part of Epping Forest. The Great Avenue here alluded to is one of the noblest avenues of trees within many miles of the metropolis, and has for generations been the favourite resort of thousands of poor inhabitants of the eastern districts of London.

CITY IMPROVEMENTS.—In the BUILDING NEWS of a fortnight ago reference was made to a proposal for opening up a new route of communication between Cripplegate and Smithfield. This proposal was that the existing thoroughfare of Long-lane should be utilised, and that at its eastern end, at the

angle formed by the junction of Aldersgate-street with Barbican, a new street should be made, chiefly through very old and dilapidated property, to Red-cross-street and Fore-street, just by the Church of S. Giles's, Cripplegate, and the eastern end of Jewin-street. This scheme was suggested by the fact that the extremely mean-looking shambles which have temporarily served as a retail market have been removed together, with a good deal of the old tumble-down property, so that a great portion of the ground which would be required has been already cleared. Another scheme with the same end in view i.e., opening up improved communication between Cripplegate and Smithfield—is being promoted, under the auspices of Mr. Alderman Besley. By this plan it is proposed to apply for power to widen the western end of Jewin-street, and thus effect a long-needed improvement. Jewin-street having been so widened, would form part of the proposed new thoroughfare, which would be continued across Aldersgate-street and through some old property, 139 to 142, Aldersgate-street into Queen-square, and from thence across Bartholomew-close, and, taking down a house or two, the new-street would emerge at the northern end of Duke-street, opposite the corner of S. Bartholomew's Hospital. By this plan the Long-lane route is discarded.

SOCIETY OF ENGINEERS.—The first meeting of this society for Session 1871-72 took place on Monday evening last in the Society's hall, Westminster Palace Hotel, when a paper was read by Mr. Perry F. Nursey on "Recent Improvements in Explosive Compounds." The other meetings of the society for this year will be held on November 6, December 4, and the annual meeting on December 11.

COLUMBIA MARKET.—A memorial from the principal shipowners and smackowners of the port of Ipswich has been presented to the Baroness Burdett Coutts, praying that in settling arrangements for the future management of Columbia Market she will stipulate that the covered square of the market, or a large portion of it, shall be continued by the Corporation of London as a wholesale fish-market for seven years after the completion of a tramway from the Great Eastern Railway to the market. When this tramway is completed, there will, it may be noted, be a direct line of rail from Harwich to the market. At Harwich it is proposed to establish a "fish reservoir company," after the plan of those which have proved so successful in France.

VENTILATION OF S. THOMAS'S HOSPITAL.—It is rumoured that the system of ventilation adopted at the new S. Thomas's Hospital has proved a complete failure, and will require a thorough overhauling. In the BUILDING NEWS of January 27th and February 3rd last, Vol. XX., pp. 62 and 82, the plan of ventilation adopted by Mr. Currey, the architect, is described by himself in a paper read before the Royal Institute of British Architects. In our report of the discussion which followed the reading of the paper, it will be seen that some doubt was then expressed as to the efficacy of Mr. Currey's arrangements for ventilation.

Chips.

The repairs at the Mansion House have been completed, and the scaffolding in Mansion House-place has been removed.

New schools have been commenced for use as Sunday schools and an infants' day school, at Winwick, Lancashire. Mr. William Owen, of Warrington, is the architect.

The death is announced of M. Joseph Piquer, the celebrated Spanish sculptor.

The foundation-stone of the new church of S. Paul, Sheerness, was laid on Thursday week. It will be in the Gothic style, and accommodate 500 persons. Mr. R. Wheeler, of Tunbridge Wells, is the architect.

The Birmingham Town Council, last week, gave its sanction to a scheme of tramways. The estimated outlay is £136,195.

A class of instruction in military engineering has been formed at the School of Military Engineering, for officers stationed with their corps in Chatham garrison.

A valuable collection of books has been sent from the Trustees of the British Museum, as a present to the Birmingham Reference Library. The books chiefly relate to antiquities and art, and to natural history—26 volumes coming in the category of the former, and 125 in that of the latter.

It is probable that Queen Victoria-street will be opened for public traffic by the 9th of November.

The new pier at Westward Ho, North Devon, was washed away on Thursday night, the 28th ult., by a heavy ground swell.

Mr. Josiah Mason, who last year built and endowed, at a cost of over a quarter of a million, an orphanage home at Erdington, near Birmingham, has resolved to make important additions to that noble institution, which at the present time contains 222 boys and girls. It has been considered desirable by Mr. Mason and others that there shall be a separation of the sexes, and to that end he has determined to erect a new wing, with dormitories to accommodate 100 children.

A remarkable group of conical stone monuments, made of smooth and apparently hewn stones cemented together, and evidently the work of skilled builders, has been found near Death Valley, in Southern California. There are probably one hundred in all.

On Monday night, the 25th ult., the New Theatre Royal, Belfast, which has been erected at a cost of £13,000, was opened.

A building, erected at a cost of £3,000, for the use of the Salisbury Literary and Scientific Institution, and the Salisbury School of Science and Art, in New-street, in that city, with a hall capable of seating 800 persons, was publicly opened on Monday.

A new church has lately been consecrated at Apsley End, Hemel Hempstead. The building, which has cost £7,000, is from a design by Mr. Joseph Clarke.

Writing with respect to the British Museum, Mr. George Ellis remarks that in that building there is one of the most interesting collections of portraits in all England, but they are placed as far beyond the reach of human vision as the originals are removed from earthly care. He suggests their removal to some other better place.

Engineers have been making surveys for a tramway from Howdon to North Shields.

An Act authorising the expenditure of £100,000 on a harbour for East London, Cape of Good Hope, has passed the Cape Legislature.

The late Master of Emmanuel College, Cambridge, has by his will bequeathed a legacy of £6,000 to the college. The bequest is entirely unconditional, and the governing body have absolute power of applying it in any way to the advantage of the society.

At Salford, Birmingham, Mr. Hardwick has completed the tower of S. Saviour's Church. The tower is 17ft. square, and is now 85ft. high, with a corner turret 15ft. higher. The cost of the work was nearly £1,000.

The Alexandra Music Hall, Union-street, Southwark, London, was entirely destroyed by fire on Thursday evening, September 28.

The Roman Catholic Church of the Holy Name, Oxford-road, Manchester, is announced to be opened on the 15th of October.

The foundation-stone of a chancel for S. Peter's Church, Fylde-road, Preston, was laid on Saturday afternoon last by Dr. Spencer, Mayor of Preston. With the addition of the chancel, the church will have a capacity for 1,200 persons; 650 of the sittings will be free. The chancel will cost about £900, of which sum £650 has been received or promised.

The late Dr. Wilson, Glenernie, near Forres, who died on Sunday evening, the 24th ult., has by his will bequeathed a sum of about £10,000 to the University of Aberdeen.

A Protestant Church is about to be built in Rome. The ground has been purchased, says the *Gaulois*, by an American company, who propose to build an edifice of great magnificence.

Timber Trade Review.

PRICES, October 2.—Per Petersburg standard hundred: Wybrun best yellow, £9 15s. to £10 15s.; Archangel best yellow, £12 15s. to £14 10s.; ditto second quality yellow, £9 10s. to £10 5s.; Petersburg best yellow, £13 5s. to £13 15s.; spruce batons £7 to £15s.; United States pitch pine planks, £12 10s. to £13 5s.; Quebec first quality floated yellow pine, £16 10s. to £18 5s.; ditto second quality floated, £12 10s. to £13 10s.; ditto third quality floated, £10 10s. to £9 5s.; ditto first quality bright yellow pine, £13 to £19 10s.; second quality, £13 5s. to £13 15s.; ditto third quality, £8 15s. to £9 10s.—Timber per load of 50 cubic feet: Swedish, £2 5s. to £2 15s.; Riga, £3 7s. to £3 8s.; teak, £12 10s. to £13 10s.; best middling Memel, £3 5s. to £3 15s.; pitch pine, £3 10s. to £3 15s.—Wainscot per 18ft. cube: Riga, crown, English and Dutch, £4 to £5; ditto brack, £3 to £3 5s.; Memel and Dantzic crown, £3 15s. to £4; ditto brack £2 to £2 8s.—Lathwood per cubic fathom: Petersburg, £5 to £6 5s.; Riga, Dantzic, Memel, and Swedish, £3 to £4.—Firewood per cubic fathom: Swedish deal ends, £4 5s. to £4 12s. 6d.; Norway red and white boards, £3 5s. to £4; ditto round and lags, £2 10s. to £3.—Oak staves per mills of pipe: Memel crown, £170 to £175; ditto brack, £145 to £150; Dantzic, Stettin, and Hambro, £120 to £160; Canadian standard pipe, £85; puncheon per 1,200 pieces, £25; Bosnia single barrel per 1,200 pieces, £29 to £30; hogthead, heavy and extra, £35 to £45; slight ditto, £30 to £32.—Flooring boards per square of 1in.: first yellow, 9s. to 10s.; ditto white wood, 8s. to 9s.; second qualities, 6s. to 8s.; matched boards per square $\frac{1}{2}$ and $\frac{3}{4}$ inch, 5s. to 8s.

THE BUILDING NEWS.

LONDON, FRIDAY, OCT. 13, 1871.

THE NEW LAW COURTS.

NOW that a strong division of Mr. Street's staff is firmly established, and in full working order, in his office on the site of the New Law Courts, the time has come in which our readers may fairly expect from us a faithful, impartial, and full notice, both descriptive and critical, of the designs that at length are on the point of being carried out between Carey-street and the Strand. The adverse critics have said their say; and it is but justice to them to add that they have done their best. If they have not been generous, they certainly have been candid. When they endeavoured to explain what they desired the building for the New Law Courts to be, if not always particularly clear and intelligible, they never have failed to express distinctly and emphatically their condemnation of Mr. Street's designs. Perhaps, had they been not quite so much in haste, and had they bestowed upon the entire series of his drawings of both plans and elevations a little more thoughtful observation and more careful study, even the most hostile of Mr. Street's critics might have written with somewhat less of bitterness, and their condemnatory sentence might have been in some degree less sweeping and absolute. It will be remembered, as at once the conclusion at which the criticisms adverse to Mr. Street aimed, and the consummation which they claimed to have achieved, that the designs for the New Law Courts were declared to be still in abeyance. Taking the lead in this particular, and not content *spargere ambigua voces*, or to hint that new designs once more might be required from the architect, with characteristic cool assumption of authority, the *Times* in so many words positively asserted the rejection of Mr. Street's last designs by the Government to be a matter of fact. Instead of being a fact, however, this idea of rejection is pure fiction. There exists no authority whatever for any such assertion or suggestion. Mr. Street's designs have been formally approved and officially accepted by the Government; and in consequence of this formal and official acceptance and approval, the work of preparing the foundations has commenced and will be continued; the quantities also of some of the most important parts of the building have been taken for the contractors, the remaining quantities are being taken, and all other preparations for erecting the entire building from Mr. Street's designs are in the act of being carried on, and they will be carried on vigorously and without the slightest probability of any interruption. The contract for the foundations, taken for £35,060 by Messrs. Dove Brothers, of 15, Studd-street, Islington, was signed by the heads of that firm, and on the part of the Government by Mr. Street, in February last; and, as we write, the ground for the main block of the building is being rapidly levelled, and the concrete for the foundations over a considerable space has already been laid. As a matter of course, during the progress of the work, some modifications in matters of detail may be introduced into his designs by Mr. Street; as, in fact, since his recent return from Switzerland, he has done, with admirable effect, in the flanking staircase turrets of the grand entrance to the central hall in the Strand front. At the eastern extremity of this same front also, where Mr. Street had proposed to erect a clock tower of a noble and truly original character, the design that will be actually carried into effect has not yet been finally adopted; and, in like manner, the termination of this same Strand front towards the west has still to be decided. And again, some slight change in the line of the Strand front, accompanied with a correspond-

ing addition to the width of Carey-street, might follow should it be decided, as has been proposed, to pull down the church of S. Clement Danes, with a view to rebuild it on the site offered by the Government for that purpose more to the north, thus accomplishing an important widening of the thoroughfare of the Strand where it is urgently required.

Bounded north and south by Carey-street and the Strand, with Lincoln's-inn and the Temple close at hand, on the east by Bell-yard, a little in advance of Chancery-lane, and towards the west having an open space intervening between its own front in that direction and Clement's-inn, the building for the New Law Courts will cover an approximately square site of about 500ft., and, consequently (the quadrangle and the other open spaces being included), it will stand on an area of about 28,000 square yards. The Strand front, it must be added, will certainly exceed 500ft., since it will extend in both directions beyond the east and west fronts; but, as has been already stated, the extremities of this Strand front are yet under consideration. The surface of the ground has a slope from north to south of 16ft., the mean levels (given as in the datum in the maps of the Ordnance Survey) being, Carey-street, 62ft. above the mean sea-level, and the Strand 46ft. The floor of the central hall will be 50ft. above the sea-level, or 12ft. lower than Carey-street, with an ascent of 4ft. from the Strand; and the level of the floors of the actual courts will be 67ft. above the sea-level, that is, 17ft. above the floor of the central hall. The general plan of the entire building, briefly stated, is such as this. A single great rectangular block, covering the whole area from north to south, extends eastwards from the line of the west front 320ft., and contains the central hall and all the courts. Further to the east is an open quadrangle, measuring 100ft. from west to east, and 340ft. from north to south, bounded by a narrow range of building towards the north, and towards the south by a somewhat more important range, which buildings severally constitute parts of the Carey-street and the Strand fronts. These are connected eastwards with the building which closes in the quadrangle in that direction. This building, which is comparatively narrow, like the main block, ranges over the full extent of the site from north to south, and its exterior face forms the eastern or Bell-yard front of the edifice. Throughout these buildings the level of the floor of the courts is distinguished as the "court floor." Above this level are two floors, severally distinguished as the "first" and "second floor above the court floor," and, on the other hand, lower down, there are a "first" and a "second floor below the court floor."

In assigning to their most appropriate and consistent uses the various parts of this vast extent of building, and in so assigning each and every part under the most advantageous conditions, before arriving at his final conclusions, the architect has not failed to avail himself of the prolonged period for reflection and reconsideration which the peculiar circumstances connected with the introductory chapter in the history of the New Law Courts unexpectedly placed at his disposal. Thus, amidst much of loss from the delay that has attended the commencement of the works, there is this one great gain, that the plans for the disposition, the arrangement, and the adjustment of all the parts of the whole building have been elaborated to a degree that may be pronounced almost incapable of further improvement. The most anxious thought has been bestowed again and again upon each individual part; and no one part has been allowed to assume its place in the building, until after it had endured the most searching and exhaustive tests many times repeated. In dealing with his designs for this great national edifice, unlike the hostile critics by whom Mr. Street's plans were overlooked and ignored altogether, this per-

fection of his plans, the importance of which it is not possible to estimate too highly, we consider to demand for Mr. Street the warmest commendation. And this opinion is confirmed by the fact that the more minutely Mr. Street's plans are examined and the more severely they are subjected to every variety of practical trial, the more complete is their triumph; so that, instead of a competition, in the first instance had a council of architects been held for the sole purpose of producing the best possible plans for the proposed New Law Courts as the result of their concerted action, the architectural designs being left for subsequent consideration by individual architects, we are convinced that no better plans would have been devised than those which now have happily been approved and adopted by the Government.

THE PLANS.

In proceeding to examine these plans more in detail, we commence with the lowermost floor, and advance from it upwards. It is to be observed—and this is a quality in Mr. Street's plans which will become more palpable, and therefore better to be appreciated, when we shall have been enabled to engrave the plans themselves—that in no single instance throughout the entire building in any part of any one of its floors is there borrowed light; nor has this universal presence of direct lighting been obtained either through the sacrifice of any space that could not be consistently and advantageously assigned to such a purpose, or by an occasional eccentricity in the positions occupied by any of the windows. This perfect system of direct lighting from without is declared in a very few words; but, the judicious and comprehensive arrangements that had to be made, together with the grave and widely-diversified difficulties that had to be met and overcome in carrying it into effect, while they may be readily understood, may be said to defy anything like minute description. The ventilation, again, is no less worthy of high praise, from the boldness and completeness of the system with which it has been planned and carried through every part of the building. As our description advances, in addition to the presence of true windows wherever the admission of light may be necessary or desirable, in the arrangement of the doorways, the stairs, and corridors, we shall have occasion constantly to direct attention to the thoughtful and vigilant care displayed in making full provision, not only for all the ordinary requirements of whatever business might legitimately be expected in connection with Courts of Law, but also to meet and satisfy any and every exceptional contingency. In connection with the absence of all borrowed lights in Mr. Street's design, we may here record the fact that, with one or two exceptions only, which in reality are scarcely exceptions at all, throughout the building the windows are without tracery. The heads of the window-openings also are very generally square, even when the pointed relieving arches of the windows constitute integral features in the design. Again, when they do appear, the mullions that are introduced are of the slenderest proportions consistent with strength and stability, so that all the windows, as well the mullioned as the mullionless, admit the light in abundant measure and with unrestricted freedom. Moreover, one of the severest of the hostile critics may be pleased, or perhaps displeased, to learn that, being Gothic, every window that ought to open will be found both to open and to shut in a manner that will leave nothing to be desired. Thus, in these supremely important features of his design the architect has strictly conformed to the prevalent idea of our own times as to the proper characteristics of civil and domestic buildings, as distinguished from such as would be designed for ecclesiastical uses. Unlike his critic in the *Times*, whose profound ignorance of Gothic architecture and

his consequent unfitness to deal with the designs which he presumed to condemn was shown in a signal degree by his pronouncing "Ecclesiastical Gothic" to be a distinct architectural style. Mr. Street is one of those masters of Gothic art who know as well the unlimited comprehensiveness of the great style and its equal applicability to the distinctive circumstances of every age, as they know the plastic elasticity with which, ever true to its own essential and characteristic attributes, it adapts itself in practice to buildings of every variety both of use and magnitude. When preparing his designs for the New Law Courts it would have been simply impossible for Mr. Street to have treated Gothic architecture as if he had been designing a cathedral. The style, as he well knows, and as every one well knows who has any true knowledge of the style, has its own proper expression for each class and order of building, so that none but the most inexperienced novice could confuse the forms of Gothic expression or mistake one of them for another, or could conceive the possibility of any such confusion or mistake having been unwittingly made. Mr. Street certainly is not the man to have made any mistake of this kind, either deliberately or unconsciously; and the critic of the *Times* has shown that no less certainly he is capable both of making such a mistake and of not being aware of having made it. It is true that the earliest Christian churches were originally basilicas, civil edifices converted to ecclesiastical uses through the exigency of the times; and it also is equally true that from the structural features of the primitive basilican churches the ecclesiastical edifices of after ages (except in the great and significant feature of a cruciform plan) derived their primary type; still, this by no means implies, or even suggests, any necessary identity of treatment in civil and ecclesiastical buildings when architects became free to design and erect each class of buildings in happy independence. It is a subject of archaeological interest to know that in early times great civil buildings should have been elevated to far higher uses than their builders could have contemplated for them, as it also is an historical fact that Gothic architecture—in this respect differing from Classic, which has only its pediment-carrying colonnade as its sole typical feature for every class of building—always has been able to produce secular and ecclesiastical buildings of equal excellence, each of them endowed with qualities emphatically peculiar to themselves. What Gothic architecture did in past times it is competent in able hands to do now—an assertion demonstrated by the eminent ability displayed in his strictly secular application of the Gothic style by Mr. Street in his designs for the New Law Courts.

THE BASEMENT FLOOR.

This floor, the second below the principal or "court floor," of which the level varies from about 20ft. to 30ft. below that floor, is assigned in part only to rooms for special purposes; and the rooms so assigned are situated on the south-west and south-east sides of the main block, and are continued throughout the range of building to the east of the quadrangle. On this floor, which is traversed by tramways, are to be placed the boilers for the hot water to be used in heating the main block of the building. Here also are the stands for the fire-engines, the cellars for the coal-stores, &c. Towards the west is a range of public and private rooms and of offices for clerks and others connected with the Enrolment Office, the solicitor to the Suits Fund, and the Common Law Associates. To the east are corresponding arrangements for the officials of the Examiner's Office, the Circuit Associates, and the Petty Bag. On both sides are entrances with stairs communicating with the floor above. To the east of the quadrangle are the ranges of the Record and Writ fire-proof rooms, the other fire-proof rooms for

the Queen's Bench, Common Pleas, and Exchequer Masters; also, towards the south are separate rooms for searchers, with a hall, distinct entrances, and stairs.

The floors which next rise in succession one above another, in addition to a concise general description of each one in its order, will require also to be considered collectively, since in the distribution and aggrondissement of their respective contents they have a very close and intimate connection.

THE CENTRAL HALL FLOOR.

This floor, the first below the "court floor," has its level varying from 5ft. to 12ft. above the level of the Strand, and at its highest it is about 6ft. below the level of Carey-street. In the main block the more important of the varying levels are occasioned by the introduction of a mezzanine, which has been utilised to great advantage. Midway between the west and east faces of the main block, its own south end 80ft. from the line of the strand front, and its north end 160ft. from the line of the Carey-street front, is the great Central Hall, its internal dimensions being 230ft. by 43ft., with a height of 75ft. from the floor to the crown of the vaulting, the floor being 4ft. above the mean level of the Strand. On this floor the central hall has, on either side, seven open spaces which light the parts of the building adjoining them; and there are five passages which lead from each side of the hall, severally to the west and east. On the south the entrance is from the Strand, by a low flight of steps, through an outer and an inner vestibule; but, as it was a point of special importance that the hall should not be used as a thoroughfare, instead of any direct approach from Carey-street (where the levels differ by 12ft.), there are side entrances opening to broad corridors, from which, besides communicating with the Central Hall, there branch out corridors and passages in various directions. Commencing to the west of the hall and at the south, and advancing northwards, the plan shows the public stairs to the galleries of the courts, with the adjoining smaller staircases for juries; then an arbitration room, succeeded by lavatories and other conveniences, with rooms for stamps and cause lists, and shafts for air and smoke. Further west are three distinct flights of witnesses' stairs leading right and left, with five sets of separate rooms for male and female witnesses; the same number of jury rooms, with three flights of stairs for juries; a large room for stores, ventilation-shafts, three great openings for light and air, lavatories, &c. Still further west, bounding the groups of rooms already mentioned, but accessible from the central hall by attorneys and their clients through the mezzanine, is the attorneys' corridor; and beyond this, in succession from south to north, are a room for service with a lift, the Vice-Chancellor's stairs, four consultation-rooms, porter's-room, judges' entrance and stairs, a fifth consultation-room, separate rooms for the Sheriffs of Middlesex and London, stairs for officers, a waiting-room, the Queen's Advocate's room, rooms for the Solicitor-General and the Attorney-General, clerks'-room and waiting-room, another consultation-room, another flight of officers' stairs, and a seventh consultation-room, beyond which is the entrance and corridor leading to the central hall from the west front of the building. On the east side of the central hall, and between the hall and the eastern attorneys' corridor, the arrangements closely correspond with those on the other side just described, except that here is the post-office (adjoining the centre of the hall, and corresponding with the stamps office on the opposite side), and a bar robing-room near the south-eastern public stair-turret. To the east of the attorneys' corridor, the succession of the rooms gives the upper part of the entrance in the south-east angle, stairs to bar-room and the Vice-

Chancellor's chambers, service-room, five consulting-rooms, porters'-room, Judges' entrances, hall and stairs, lavatory, officers' stairs, record-room, chief clerk's-room, public office, room for the Queen's Coroner, Master's office, officers' stairs, and secretary's-room and waiting-room. To the north of the central hall, on the north also of the broad corridor which connects the western and eastern main entrances, and on either side of the corridor leading northwards in the same line with the axis of the central hall (which corridor extends to Carey-street, but has no communication with it, being 10ft. below the level), are the special jury hall and the jury hall, with spaces for light and ventilation. More towards the north is a corridor running west and east, and beyond it two other spaces for light, two flights of public stairs to the galleries of the courts, with a second bar robing-room and a refreshment-room. More to the north-west are flights of stairs for witnesses, juries, and officers; rooms for juries and male and female witnesses, two consultation rooms, and two more light spaces; and again, to the west of what may be regarded as the prolongation northwards of the attorneys' corridor, are stairs to the Vice-Chancellor's chambers, principal clerk's-room and presentation office, pursebearer's-room, sealing-room, officers' stairs, messengers'-room, and lavatory, &c. On the east of the central corridor the arrangement differs so far as to provide kitchens and store-rooms adjoining the refreshment-room; and to the east of the line of the eastern attorneys' corridor the arrangement gives a consultation-room, public stairs to the Master of the Rolls' chambers, with the station of the police and a room for service with a lift. Separated, towards both the south and the north, from the main block by the open archways that lead respectively from the Strand and Carey-street into the quadrangle, the long range of the building to the east of the quadrangle on this floor has been arranged in the manner following, commencing from the Strand front: Entrances from both west and east, with stairs connected with the latter entrance; six large rooms for business connected with writs, appearances, and judgments; a hall and a passage leading northwards to the main corridor of the Common Pleas Masters, who have, connected with that corridor, six offices for themselves, in addition to two clerks' offices, a lavatory, and a hall for attorneys. Further north is the principal entrance on the front towards Bell-yard, with flights of stairs leading to the room of the Queen's Remembrancer, the Chancery Registrars, and the Taxing Masters, with porters'-lodge and retiring-room, and stairs leading to the quadrangle. Further on are the offices in connection with the Accountant-General's Department, consisting of the rooms of the Accountant-General and the chief clerk, with a waiting-room, and six public offices; and, still further north, three Record, Writ, and Report offices, two offices for general business, Clerks of Records and Writs offices, public stairs to the offices of the Chancery Registrars and Taxing Masters, with corridor, porter's-lodge, and service-rooms, and an entrance from the archways leading from Carey-street to the quadrangle.

(To be continued.)

CHARACTER IN FOIL DESIGN.

IT ought to be needless, at this time of day, to point out how many shades of character and expression may be produced by slight changes in the proportions of cusped work. We do not mean such palpable obvious changes as arise, for example, from a variation in the number of the cusps. Everybody knows the difference between the look of a trefoil and that of a quatrefoil or a sexfoil; but it is not everybody, even amongst architects, who seems always to remember the difference

between a trefoiled circle whose cusps project till they nearly meet in the centre, and one in which they scarcely break the line of the circular curve. Yet these two differ in expression as much as two adjoining notes in a musical scale, and between the two lie as many intermediate forms in the one case as tones in the other. Strange to say, in a great deal of what passes for "modern Gothic" this important fact is overlooked. The designer apparently tells his assistants to put in a trefoil here and a quatrefoil there, as the case may be; but what sort of quatrefoil or trefoil they may put in is left pretty much to accident. It may be the sort that is wanted there, and which just suits the adjacent forms, or it may be that which would be better away, and which jars with all its surroundings. There is no one form, either of arch, or buttress or foil, which is the best for all purposes indiscriminately. An architecture that is worth anything at all must adapt itself to circumstances, and modify its details to suit particular cases. There is, unfortunately, no "standard example" of anything which we can copy for all purposes, and so save ourselves the trouble of thinking. Even the eighteenth century apostles of architecture-made-easy found this out in the course of their researches. Poor Sir William Chambers and his imitators used to be sadly puzzled by the different proportions which they found in the same "order" at different places, though it never occurred to them that the difference might be a beauty instead of a blunder. But as Gothic is a much freer style than Greek or Roman, so it admits of much wider differences, and the architect who always sticks to the same unbending rules is, to say the least, very far from making the best of it.

We have before us a series of photographs which show some of the varieties of foliation traceable in certain English and French churches, and there is something wonderful in the multitude of different effects which these comprise. Take, for example, the trefoiled arch so frequent in Early Gothic arcades. In the front of Peterborough Cathedral a band of them runs across the tops of the great arches. They are not pointed, but round, and their cusps project so little that at the first glance one might almost fancy them to be semicircles. Yet they are very beautiful and very delicate; had their outline been more marked it would have detracted from the importance of the wheel windows above; had it been absolutely circular it would have looked heavy, and have jarred with the pointed work in the rest of the design. In the front of Lichfield Cathedral we see another arcade, also of the round trefoil shape. Here, amongst a mass of tracery and crocketing, the refined outline of the last example would have been overpowered: the cusping is therefore more prominent, and the form altogether more marked. In a lower stage at Peterborough is another arcade, and a very good one, this time of the pointed trefoil. The cusp is placed rather high, and the general outline tolerably steep. At Wells Cathedral is a broader sort of pointed trefoil, the span being rather greater than the height. But this is nothing to what occurs in the arcade above the great doorways at Notre Dame, Paris. Here the trefoils spread out till they are nearly three times as wide as they are high; and the difference of expression between these and the Peterborough ones can hardly be described in words. A niche on each front buttress at Notre Dame shows, however, a still more curious variety; for the side curves of the trefoil actually turn right over and hang down, so that the cusp becomes a stone pendant on a small scale. At Amiens Cathedral, which may close the list, is another and most delicate mode of working out the same idea. The cusps are very slight; the proportions are rather wide than high; and the central curve has so faint a point that the eye scarcely discovers at first what makes the trefoil look so different from the round ones

at Peterborough. We turn next to the cases in which the foils are arranged in a circle instead of in an arch. The first great difference of expression depends on whether the enclosing circle is or is not visible round them. If the outer moulding follows the outline of the foils, a very marked and conspicuous character generally arises. A circular border, on the contrary, somewhat lowers and simplifies the effect, substituting as it does a single curve for a multitude of angular lines. Each form has its appropriate situations, and in good work there is no such thing as using them indiscriminately. At Peterborough the wheel windows have a bold enclosing circle of mouldings; at York, if we remember rightly, there is one in which the mouldings follow the zig-zag outline of the radiating arches. At Amiens, on a buttress between the front portals, is a lovely sexfoil panel in a ring of foliage; at Peterborough, in each spandrel between the great arches and the string is an equally lovely one, with a dripstone worked in and out to follow its curves. At Notre Dame, Paris, some smaller spandrels of like kind are filled with unclosed trefoils, having cusp terminations of foliage; at the fine church of Raunds, Northamptonshire, a similar position is occupied by very similar trefoils, which here receive additional richness from leaves curling over them at intervals. At Raunds, by the way, is another form of trefoiled arcade not before referred to—that, namely, in which an outer and somewhat lofty pointed arch holds within it a round trefoil of strongly-marked character. There is a fine example of this species at Dunstable Priory Church, illustrated in the BUILDING NEWS of November 18, 1870. But, returning to symmetrical foiled designs, their expression varies wonderfully, according to the position of their vertical axis. A quatrefoil, for instance, placed with a cusp uppermost is a very different-looking object from one placed with a foil at top and bottom. The one is to the other precisely what a square is to a lozenge, and it can scarcely be an indifferent matter which of the two is to occupy a given position. So it is with other forms: a trefoil with the small end above tends to lead the eye upward, and contributes to an aspiring and vertical type of design. Turned the other way, it has an effect entirely the opposite, though one that may still be useful—where, for instance, it is desired to emphasise some detail beneath it. In cinquefoils and more complex figures the difference is as real, if less striking. Septifoils, for some reason or other, are rather uncommon, though octofoils are by no means rare. One of the most beautiful of the latter which we remember is in the upper window at the east end of Lincoln Cathedral. The foils are elongated and slender in section, and each of them is itself delicately trefoiled. A greater number than eight foils in a circle is scarcely desirable, and even these are too many for ordinary occasions. When a round window comes to suggest nothing better than a circular saw, it has passed the point where elaboration ceases to be effective. Extremes meet, and too much cusping (as witness any late Perpendicular design) looks more poverty-stricken than even too little. But between the limits of trefoils and octofoils it is possible to produce almost inexhaustible variety. The endless shades of expression which the old builders contrived to get out of this seemingly narrow range are almost as wonderful as those which the musician can produce within the range of a single octave. Of this variety, the chief sources seem to be these. First, there is the obvious difference in the number of the cusps; then the equally obvious one between making them round and pointed; and, next, the scarcely less noticeable one between placing a curve or an angle uppermost, as the case may be. But the most valuable sources of variety were more subtle. They comprised differences of proportion, by themselves infinite, in the case of every pointed arch; differences in the projection of

the cusps, and the consequent boldness or weakness of the foliated character; differences in the bounding curve of the figure, which might, as we have seen, be either circular or of endlessly-varying degrees of angularity, differences in the mouldings which constitute the foils, alone sufficient to produce marked and at first unaccountable variations in effect. To these may be added all that carving can do—whether in leafy cusp-terminations, or curling crockets, or enclosing garlands of continuous foliage—not to speak of dog-tooth and nail-heads—similar descriptions of conventional ornament. Adding all these things together, or, more accurately speaking, multiplying them all into each other, we begin to see that the changefulness which has amazed us is brought about by very simple means. That they have produced such wonderful effects is simply owing to the fact that the men who used them loved their work, and were never tired of giving it more perfect harmony, more astonishing variety, more fascinating beauty. The means are as much in our power as in theirs: why should the result be so different?

THEORY OF THE ARTS.

ARCHITECTURAL COMPOSITION.—CONSTRUCTION IN ITS RELATION TO FORCE.—STONEMWORK.

(Continued from page 246.)

RESUMING our remarks on the atmospheric effects on materials, or the chemical action to which they are subjected in construction, it may be observed, from what has been said, that the resistance offered by stones and bricks will be obtained most effectually by the manner in which they are located and shaped in the building. As it is the external influences which chiefly disintegrate and destroy their composition, care should primarily be given to make them as impregnable as possible against these assaults. Thus, to place porous stone, as some kinds of Bath, in exposed situations, as the summits of buildings, chimneys, cornices, buttress weatherings, &c., as generally done, is manifestly to put them in naturally the very places where decay will be accelerated; being, in fact, to reverse their natural condition as in the quarry. Again, their shape and form should give them the greatest power of resisting the destructive agencies of the weather and other mechanical dangers to which they may be exposed. How often we find this unattended to—indeed, not thought of—by some, too, of our well-to-do practitioners. Flat, level surfaces should chiefly be avoided, as conducive to retain moisture instead of throwing it off. Thus, the upper surfaces of sills, cornices, string-courses, and the like, instead of being, as usually, nearly or quite flat—being put so to save stone in many cases—should be well sloped or weathered, and, if need be, less moulding, rather than all moulding and no weathering, should be given them. Masons, as a rule, seem to be afraid of giving too much splay or slope to their work, simply because they think it is not seen. The upper members of cornices and string-courses may often be of some harder and more impervious material than the lower parts. Again, the form of the mouldings should be such as to resist or throw off, as much as possible, rain, &c.; well-cut hollows or drips, though not too deep to reduce the mass or substance, should always form the upper members of mouldings; while deep quirks or hollows, which catch the water, should be studiously avoided in external work. It should be remembered that the conditions of outside stonework or mouldings are very different to those of internal work; but the mistake is nearly invariably made of putting the same kind of mouldings, or rather the same principles determine both cases. The hardest and most durable materials are frequently placed inside a building, while the softer kinds of stone, &c., are used for the most weather-beaten and exposed

parts, as plinths, cappings, jambs, &c. It is so difficult to get men to reason from fundamental truths. The Early Gothic architects in some of their best work thoroughly entered into the nature and substance of their materials, and wrought mouldings and stonework upon principles which cannot be too well studied. Mr. Sharpe has done something towards this; but the "principles" of their work, not the mere copy, is required. From the foregoing premises, the following seem to the author the chief principles in designing stonework:—1. Mass and squareness in dimension and form. The avoidance of slight and insufficient size is in this material very important, as no beauty of form or moulding will atone for attenuated proportions in a material of this kind. As a rule, cubes or parallelepipeds, pyramids, or prisms whose ends or bases have figures with angles not less than rectangles, are the most suitable. Cylindrical solids are admissible. The best stonemasons—the builders of Athens—knew how to work their stones with advantage, giving them all the solidity they could. So also did the Middle Age builders, till the race of non-thinking reproductionists neglected principle for mannerism. This rule is especially necessary where the idea of force or resistance is expressed. 2. The avoidance of acute angles, both in mass and contour. An angle less than a right angle on plan is both physically and æsthetically improper, in external work particularly, as a much less angle does not give that cohesive strength or resistance which is expected in a material of the nature of stone. In the contour of mouldings, also, a circumscribing line which does not make an external angle acuter than, say, 30°, is the safest; the obtuser the angle formed the better. An examination of some of the best mouldings of the Romanesque, Early English, and Decorated periods will show the groups or congeries of mouldings comprised within rectilinear, square, and receding angles. The wiry reediness of some Early English and Perpendicular examples show the departure from this principle.

Besides disintegration, mechanical dislocation is a danger to which stonework is liable. Weight and mass is the only natural condition of the material which can neutralise this, for it must be remembered that compression is the only mechanical force it can resist naturally. The Greeks only applied stone in this way, for they never trusted its strength transversely in any bearings. So also the Gothic builders, in their arched system, observed the same principle and counterpoised one weight by another, their arches and vaults being balanced by counter arches, or by weight and mass of materials in pinnacles and external buttresses. When they did apply stone, as in lintels, they fully satisfied the mind and eye by the depth and thickness they gave to the material. The dependence on the cementing power of mortar or on the mere cohesive strength of such material is to be avoided if possible, even when artificial help by joggling or cramps is resorted to. The union of stone with other similar material, as in the building of jambs, quoins, arches, &c., may somewhat modify this rule, but even here a proportionate thickness or bed is required to satisfy the eye, or the resort to a tougher material becomes indispensable. This also applies to the ribbing of groined vaults; superiority and hardness of material is demanded in all such salient features. For similar reasons all stonework exposed to harm or injury should be splayed or rounded at the angles where necessary. The union of stone with iron should be very carefully considered, both physically and æsthetically, as, though such a combination may ultimately be established upon proper principles, without some compensation or scientific connection, the variable conditions of metal make it a very doubtful companion.

Concrete and iron may, I think, admit of

more judicious architectural combination than has at present been attempted, the rigidity of the latter giving great transverse strength to the mass. The application of these two materials in various systems of flooring and roofing show the wonderful strength obtained by their incorporation. In walling, the amalgamation of the two materials and stone will probably mark a new architectural epoch before many years; and I think much might be accomplished in construction by their joint use. The surfaces of such walls would admit with far more adhesion than brick the use of polychromatic plastering and stucco, both internally and externally.

Before quitting stonework, it may be noticed how important a connection there is between geometrical form and masonry as an art. Stone-cutting must, indeed, have been one of the first arts to which the application of geometrical principles could have been applied. From the exquisite conic profiles of the Greek mouldings to the skill evinced by the Gothic masons, both geometrically and mechanically, a history of descriptive geometry as applied to architecture might be traced. The collateral aid, indeed, both arts have received by their inseparable co-operation is enough to show the connection between the "formative" and "constructive" in design, especially the value of solid geometry before alluded to as the most useful preparative to construction.

Coming to wood, as the next valuable material to stone, we find a different chemical action superinduced than that with stone. Organic influences are here chiefly at work in assisting its decay. Alternations of dryness and moisture, absence of ventilation productive of wet rot, the disease of dry rot caused by the presence of seeds of cryptogamous plants, and the natural fermentation promoted by high temperatures. Free access of air should be given to timber both before and after its use in a building, and every part should be exposed to its influence. Entire immersion in water is another preventive, preserving the wood from attacks of insects. The durability of wood in building may be artificially preserved by means of coatings of paint or other solutions applied, and known as the Kyanizing, creosoting, and other processes. The least presence of moisture or sap, however, in the wood so treated renders such a process really more destructive than preservative. All efforts have been fruitless in entirely preserving wood from decay, as many timber bridges, &c., have, in spite of all the precautions of selection and immersion in solutions of metallic salts, &c., suffered from the effects of the moisture having reached joints and parts of the timber left unprotected.

The tougher qualities and elasticity of wood, especially the fir and pine tribe, place it in a very different and more varied sphere of action than that of stone. It may be said to occupy an intermediate position between stone and iron in the composite structure. As frangibility is the characteristic property of all stones, elasticity seems to be that of wood; it therefore imposes a distinct treatment. Mankind soon found out its capabilities in this respect, though architects often put it in anomalous positions for other motives. Physically and mechanically, however, it must be considered and used, before it can be said to be properly understood in construction. From its ready decomposition when exposed to moisture, &c., it should never be used (unless due precautions are taken) in basement floors or in underground positions. Unless free ventilation between the timbers can be obtained, concrete or cement, or some other non-porous substance should invariably be resorted to for floors, &c. For upper floors, roofs, &c., it still supersedes the use of iron, from the fact of its being wrought easier, and being a more elastic material in its capabilities. It is naturally a material for under cover use

rather than for situations exposed to climatic inclemencies. As a material for external use it must always be regarded as a doubtful substitute for stone, brick, cement, or iron, and its employment should be always subject to certain rules, such as free access of air, protection from wet, and the shape it is used should subserve these ends. Horizontal and level positions for timber should be avoided if possible as the most conducive to decay, upright or sloping positions being less retentive of moisture. Besides this, the longitudinal direction of wood being also that of the grain or fibre both in the tree and in its artificial adaptation, is another important reason for the upright position, externally at least.

G. H. G.

(To be continued.)

ON TERRA-COTTA, BRICKS, AND ENCAUSTIC AND OTHER TILES.*

By GILBERT R. REDGRAVE, Esq.

WHETHER we explore the fertile basins of the Nile and the Euphrates, the cradles of our most ancient civilisation, or examine the modern rude utensils of the savage, we everywhere find numerous evidences of the use of clay by the potter. Clay, which abounds on the banks of every great river, and lines the surface of nearly every plain and sea bottom, has been employed not only for vessels, but for structural purposes, from the most remote periods, and from the date of the building of Babel until the present day, has, in nearly every country, been utilised in some form by the builder.

This clay, so universal in its distribution, and so time-honoured in its application, is not all alike suited to the purposes of the potter. Pure clay, which is, chemically, hydrous silicate of alumina, contains about forty-seven parts by weight of silica, forty parts of alumina, and thirteen parts of water, per hundred parts, and in this form, known as "kaolin," is of comparatively rare occurrence in nature. Some of the clays which are found in the plastic beds of Devon and Dorset, and the coal measures technically known as "fireclays," and largely used for terra-cotta, are also extremely pure, but contain larger proportions of silica; while the clay deposits of the more recent formations, containing varying percentages of oxide of iron and manganese, carbonate of lime, magnesia, and the alkalis, are chiefly used in the preparation of the commoner kinds of bricks and tiles.

As it is our object in the present report to deal only with the clay used structurally in the form of bricks, tiles, and terra-cotta, we have little need of investigating the composition and characteristics of the finer qualities of potters' clay; and we will now proceed, after a few general remarks, to examine the objects in the Exhibition, pointing out such peculiarities in the processes of manufacture, and of the materials employed, as appear to us to need comment.

From a brief inspection of the reports of the previous London Exhibitions of 1851 and 1862, and of that prepared by Mr. Henry Cole, C.B., on the terra-cotta shown at Paris in 1867, it would appear that, in the number of exhibitors, both English and foreign, this exhibition is fully equal to the former ones, and we may assume that it is fairly representative of the present state of our structural ceramic manufactures. We miss, however, several prominent names, and the principal firms of the Leeds, Glasgow, and Newcastle fireclay districts are conspicuously absent.

The intention of the Commissioners to avoid the separation of the objects exhibited into distinct countries and districts has, we think, been better carried out in Class VIII. than in any other, and we shall, therefore, take the various objects together as we find them, without dividing the English from the foreign, or the red ware from white terra-cotta.

We are here, even at the outset of our task, confronted with the difficulty of distinguishing between bricks and terra-cotta—a very vexed question—which many would solve by declaring that terra-cotta is a vitrified brick. We wish that this distinction would hold good, and that we could admit that all the terra-cotta was thoroughly vitrified throughout. Unfortunately, to speak of terra-cotta as a vitrified material is, in the case of nine-tenths of the ware, a misnomer. It is rare, indeed, to find a specimen in which any more than just the surface skin has been at all fused. In the case of terra-cotta made from fireclay in a pure state, the tendency to

* From the Official Reports of the International Exhibition. Published by J. M. Johnson & Sons, 3, Castle-street, Holborn.

fuse even at the surface is very limited, while in that made from mixed clays, the amount of flux, and the heat requisite to make the ware truly vitreous, is scarcely ever attained. The reasons for the more perfect fusion of the exterior of the blocks have frequently been sought after, and it has occurred to us by way of explanation that it might perhaps be due to the drying out of the water contained in the clay, which is said, in its green state, to "sweat." This water may frequently dissolve or contain in solution minute quantities of lime or alkali, which, as it evaporated, would be distributed over the surface, in the form of a thin coating or film. If this film is left intact it would tend, in the firing, to run the silica in the clay to a greater extent on the exterior than in those parts of the terracotta where this deposit is absent. If there is any truth in this theory, manufacturers ought to be careful how they meddle with the ware after it has dried, as this natural process of producing a hard surface undoubtedly tends to preserve the terracotta from decay, and to make it non-porous and durable. Another point in connection with this may also here be noticed—namely, the danger of removing from the burnt ware this vitrified surface. We have frequently seen masons hard at work in chipping away and rubbing down a lumpy or projecting joint in order to carry a true arris, and we have invariably noticed that, in a year or two, the portions of the work which had been thus tampered with have become just as black and discoloured as stone would have done, and, by admitting the soot and damp, were in a fair way to ruin the terracotta.

Perhaps the chief difficulty with which the manufacturer of terracotta has to deal is the contraction of the clay. Pure fire-clay shrinks, between the time of moulding and final firing, as much as $1\frac{1}{2}$ in. in the foot, or one-eighth lineally. Of this shrinkage, about one-half takes place in the green state, and the other half in the firing. The drying process is, perhaps, the most critical in the whole period of manufacture. If this operation is conducted too quickly, or if the ware is uneven in thickness, it frequently twists and becomes distorted, or it splits open and produces cracks which it is impossible to stop or conceal so as to stand the subsequent firing. Mixed clays shrink rather less than fire-clay—about one twelfth of their lineal dimensions. This is, perhaps, owing to their more complete amalgamation, and to an increased density, due to the incorporation of two or more differently-constituted substances.

Red clays, *i.e.*, clays which burn to a red tint, receive their colour from oxide of iron, which exists in them, generally in the form of the sesquioxide. This iron, when it amounts to eight or ten per cent. of the clay, frequently stains it of a red colour, and renders it very fusible and difficult to burn. Manufacturers have, therefore, to regulate very carefully the heat of their kilns; and objects made from red clay cannot compete in hardness and durability with those made from the purer and more refractory white clays. To obviate this difficulty, some manufacturers stain their white clays with iron; and if this is done judiciously, a good colour may frequently be obtained, and one which bears heat well; the insibility of the native red clays being generally greatly increased by the presence of the other impurities we have mentioned, consisting of lime, magnesia, and small quantities of potash and soda.

The red clays, owing to the closeness of their body and the tendency of some of their constituents to expand rather than contract under firing, rarely decrease more than one-twentieth to one-thirtieth lineally in the process of manufacture. Of course, this is partly due also to the comparatively low temperature at which the firing is conducted.

To overcome these difficulties of shrinkage, it is usual to mix with the clay certain proportions of refractory substances, such as crushed pottery ware, or, with some clays, sand, as much as twenty per cent. of these materials being not unfrequently used. The danger of mixing in with the clays varying proportions of foreign ingredients lies in the habitual carelessness of workmen, who, unless they are constantly looked after, get into the habit of making these mixtures by guess-work, and thus causing from time to time considerable variations in the amount of shrinkage. Of course, where the terracotta is compounded from a mixture of several clays, the element of danger from this source is still further increased; but we obtain very frequently in this way a much more carefully prepared body, owing to the necessity that then exists for thoroughly incorporating the various ingredients.

With such a refractory and pure material to deal with as fire-clay, the manufacturer who makes his terracotta from this substance is often led into great slovenliness in preparing it for use. Thus, nine-

tenths of the fire-clay terracotta is merely made from clay picked as to colour, to see that it is free from particles of grit and ironstone, which, after admixture with a certain proportion of "grog" (previously burnt ware), is ground under an edge runner, pugged generally with hot water, and used at once. The resulting terracotta, when it is properly burnt, is excellent in surface, texture, and colour, but appears ragged and porous directly the outer skin is removed, and manifestly suffers from the want of a small proportion of some flux, such as is obtained from the lime and alkalies in the mixed clays.

We may here speak of a practice which has come under our notice, and which, we trust, is confined to foreign manufacturers—namely, that of overlaying a coarsely-prepared, common body with a thin external coating of a finer and more expensive clay. Unless these two bodies have been most carefully tested and assimilated in their contraction and expansion, they are sure, in course of time, to destroy one another—that is, the inequality in their shrinkage will cause hair-cracks in the fine outer skin, which will inevitably retain moisture and cause the surface layer to drop off in scales after the winter frosts. This we have actually observed to be taking place in more than one large building abroad.

Another very reprehensible custom is that of coating over the clay, just before it goes into the kiln, with a thin wash of some ochreous paint, mixed with finely-ground clay, which produces a sort of artificial bloom, very pretty-looking for the first year or two after the work is executed, but sure to wear off before long, and reveal the natural colour of the materials. We could bring this fault home to some of our English manufacturers by name, but we will give them a chance of amending their ways.

We are convinced, from a careful examination of all the terracotta in the Exhibition, that this material is still far from being properly understood, and a moment's consideration points out, we think, the grounds for the abuse of what is really one of the most beautiful building materials we possess. Terracotta was brought prominently into notice at the commencement of the present century as a substitute for stone, and it is this stone treatment which has ever stood in the way of its proper appreciation. It was called in the first instance artificial stone, lithodypira, pyropolite, &c., and in the disguise of such grand names as these had to fight a losing battle with cement and stucco. To assimilate their ware to stone, manufacturers frequently sacrifice not only all the grace and delicacy of treatment for which the clay by its plasticity seems so admirably adapted, but they under-burn it in order to keep it light in colour, and, for the sake of imitating the granulations of stone-work, they destroy its surface and texture, and thus expose it to the risk of speedy decay. It is for this reason, too, that so many manufacturers aim after the production of blocks so large in size and so unwieldy that the cost of the terracotta is immensely increased, and the brick origin of the material is forgotten. It is this brick origin of the terracotta that we would impress upon our manufacturers; this should be the starting-point of all work done with baked clay. Every step which is taken away from this starting point, and which ignores this fact, is as false in principle as it is unjust and hurtful to the best interests of terracotta.

Those who know this material only by means of the very commonplace vases, chimney-pots, and flower-boxes which constitute the ordinary manufacturer's stock-in-trade, will scarcely conceive the wonderful colour and the rich and beautiful relief which terracotta is capable of receiving when properly burnt and modelled; and it is this colour and surface treatment which we search for in the Exhibition almost, we may say, in vain. Even the comparatively pure clays of Dorset and Devon, and the best fire-clays, contain a small proportion of iron, and, by long-continued firing, this iron is more or less oxydised on the surface, and imparts to the ware a rich yellow or buff tint. Of course much longer firing is needed to obtain the buff tint, and a far higher temperature must be reached than for the white or pale straw colour; and what with the increased expense of the fuel, the difficulty of insuring uniformity of tint, and the danger of unequal and excessive contraction, manufacturers are very shy of the rich-coloured terracotta. For our own part, we do not care to see terracotta too uniform in tint or too regular in appearance. The play of colour in adjacent blocks, if not too marked, is, we think, rather an advantage than otherwise, and a slight unevenness in the lines of the string-courses and mouldings serves at once to distinguish between this material and stone, and to give it a character of its own.

Having thus, in general terms, indicated our views upon terracotta, we may pass on to notice the works

of individual exhibitors. First, in point of excellence and number, are the objects contributed by Messrs. Doulton & Co., of Lambeth, whose works, situated as they are in the heart of London, must have forced them to compete under most disadvantageous circumstances with manufacturers in localities where both coal and clay are cheap. Messrs. Doulton do not seem to hesitate about the size of the pieces they undertake, as many of the objects they exhibit are truly colossal when one comes to consider the difficulties which such objects entail. The cumbrous moulds, the time required for drying, the moving in and out from the kiln, and the chance of some flaw spoiling the whole work, are all serious considerations in dealing with such large pieces, and we must give Messrs. Doulton great credit for their success in overcoming all these technical difficulties. The prevailing tint of the ware shown by this firm is rather too pale, and their designs for trusses, caps, and brackets are rather antiquated. This does not apply, however, to all their work, for we find some finely-modelled roundels by students of the Lambeth schools, and some well-treated architectural enrichments. The fountain shown by Messrs. Doulton, which, for want of room in the arcade, has been erected in the garden, near the brick machinery annex, is a good example of this class of work. We must confess, however, that we do not quite like to see terracotta used for large pieces of statuary or ornamental objects, where it only serves as a cheap substitute for marble.

Messrs. J. Stiff & Sons, another Lambeth firm, send numerous examples of the uses of terracotta chimney pots (called in the north chimney cans), vases, rather too cast-iron-like in treatment, garden edgings, and a large collection of arch blocks inlaid with clays of various colours. This firm seems to aim chiefly after utility, and may be congratulated on the general excellence of its goods. The coloured inlays they send make a great show; we presume they are produced by staining the white bodies, which are then run into cavities formed for them in the clay. Some vases sent by Messrs. Stiff are noticeable from having *applique* enrichments in red clay on a white ground, a form of decoration which admits of very good effect, but which gives rise to many difficulties, on account of the difference in the contraction of the two clays.

(To be continued.)

SANITARY INFLUENCES.

IN the Health Department of the National Association for the Promotion of Social Science, which has just concluded its annual meeting at Leeds, the question of improved sanitary measures has been fully considered.

On Friday last, Mr. P. H. Holland read a paper on the Improvement of Working Men's Dwellings, taking precisely the same views as the Rev. Charles Kingsley, who read a paper on the subject at a meeting of the Association in 1858. The following extract from Mr. Kingsley's paper, it was stated, embodied Mr. Holland's opinions:—

"Cottages fit for a family must now be let in competition with those constructed at the lowest possible cost, the saving of expense involving the almost inevitable sacrifice of their inmates' comforts, health, morality, and possibly life. Unless the letting of dwellings unfit for habitation be prevented, the poorest would be forced into them, just as certainly as they would be fed on tainted meat and doubtful bread, if such were permitted to be sold. On the same principle that the fair trader should be protected against the unjust and injurious competition of the seller of unwholesome food, and thereby be enabled to get a fair price for a fair article, so might the owner of a wholesome house be protected against those who offer houses to let, healthy existence in which is scarcely possible. It might at first glance appear hard upon the poor not to allow the cheapest possible houses to be let. But an unhealthy house, however low rented, was very dear. Sickness in a poor man's dwelling exacts a rent far heavier than the greediest cottage speculator dreams of. Cost of doctoring, nursing, loss of time, and diminished strength quickly absorb all apparent saving of rent; any who should estimate the value of life destroyed, the cost of wives made widows, children orphans, parents childless, of domestic morality destroyed, or not fostered for want of domestic decency and comfort; of a population at once weakened, diminished, and degraded. Such cost, such loss, exceed tenfold the difference of rent of houses unfit for habitation. It is waste of money, as well as of life, and happiness and morality, and of interests higher still, to permit men to live as many of our poor do, and, unaided, must. But it may be feared that if the cheapest houses be prohibited many now independent must become paupers. Not so, however. The low-

rented houses, by preventing better being let, create far more paupers than they prevent, if they prevent any. Far better would it be for the ratepayers to maintain a few paupers than to allow a large portion to become paupers because of the sickness and death the housing of the mass of the poor, as they are now housed, must and does occasion. This principle of legislation was not new, as it had been acted upon on many an occasion. In Liverpool the habitation of cellar dwellings was prohibited, and the operation of the law had been most strikingly beneficial, saving many hundred lives a year. To have placed lodging-houses under inspection was a wise and kind interference with the liberty of the subject. The result had been triumphant—disorder conquered, fever banished, death restrained, decency secured, comparative comfort obtained, and cheapness not sacrificed. What was wanted was the extension of the same principle of inspection by impartial examiners and control by legal authority to the whole class of dwellings inhabited by those who cannot and do not sufficiently protect themselves and their still more helpless families. He saw no reason why the right of inspection and the power of control should not be extended to all dwellings whatever, with whatever precautions might be thought necessary to guard against the risk of intrusion upon domestic privacy—a very shadowy danger, it appeared to him. The inspection and publication of the results would do much to bring about the remedy which local authorities had the power, but not the will, to apply. Where exposure of the neglect of the local authority was insufficient to raise a controlling local opinion, appeal should lie to some external and independent authority, which would decide the point at issue on its merits."

Dr. STALLARD (London), in opening the discussion, confined his remarks to a criticism of the last speaker's paper. He objected to the improvement of private property at the public expense, and held that the so-called improvements in Liverpool were a miserable failure. There might be good houses, and yet by the character and the habits of the inhabitants they might be unwholesome. Bad houses also might be made healthy by the care of the inmates. It was upon that principle that they must look for the improved sanitary condition of the lower order of the people. One great remedy he depended upon to a great extent—the influence of the intelligent people upon the classes with whom they had to deal.

Dr. FERGUS (Glasgow) described the operations of the Improvement Commissioners in Glasgow, and explained the object in view to be the getting of people to work in the centre of the city and to live in the suburbs. He deplored the difficulties encountered amongst the low class Celtic population. Sir John Pakington, he pointed out, had made a curious mistake in his inaugural address about the death-rate of Glasgow. Instead of being five per thousand, it had been thirty-one per thousand for some years.

Mr. G. W. HASTINGS opposed the giving authority in sanitary matters to an infinite number of small bodies conflicting with one another. To carry out sanitary improvement really throughout the country the only chance was that it should be done by an authority operating over large areas. He expressed himself opposed to earth closets in large towns, but believed their adoption advisable in the country, and it might be useful to consider what form of closet should be recommended.

Mr. C. LAMPORT (London) wished to mention one or two points upon which human habitations not only for the working classes but for all classes, might be made a little more suitable. He maintained that there was not an architect competent to construct a house who did not put into practice the principle of old Fuller, that a man ought to build his house to live in and not to look at. There was a practical mode of ventilation which, he contended, was efficient, and would not cost 1s. 6d. Let there be built into the walls, on a plan he had carried out, three or four inch tile drains, every three feet communicating with an open cornice. This system of air drainage he would carry into a separate air-shaft connected with the chimney.

Mr. RAWLINSON, C.E., said that from a statesman's point of view this question of providing the best form of human habitations had been neglected, so far as his knowledge went, from the very earliest dawnings of history. He knew of no nation that paid attention as it ought to do to the dwellings of the lower class population. One of the great evils of the construction of dwellings in this country was, first of all, the utter regardlessness of the site, and the subsoil and the material, and the mode of construction, and then the mode of management subsequently. Now, whether people were going to build cottages for themselves, or cottages or villa

residences, or palaces, the first necessity was to have a dry subsoil. If not naturally dry, the soil must be dried by the best means. The second necessity was that the area upon which the buildings are about to be erected must be isolated from the subsoil, and the cheapest and best means was to use concrete. The next thing was that there should be put in a damp-proof course to prevent the damp rising into the walls. Then if there was a basement story, it should be isolated from the ground; the earth should not come in contact with the walls. With regard to the arrangement of the rooms, the last speaker had told them that means must be applied to give ventilation. He might say, briefly, that domestic houses had two purposes to serve as we use them. They had the domestic purpose for the family—that for the cottager was the entire purpose the house served, as they had few visitors—and the more ornamental purpose. But there was the time when sickness came. People ought to be taught they could not live healthily within the four walls of their dwelling, whatever the arrangement might be, if they did not open their windows and admit air. Those who visited the dwellings of the poor should see to it that the windows of the bedrooms were opened, and if they did not open, the landlord should be asked to make the requisite alterations. If the outside air were let in, Nature would do the rest; she would oxidise and purify. If there was a window on a staircase, and there was no other means to procure ventilation, he recommended that the window should be let down some three inches from the top and screwed fast, so that none of the servants or any one else could ever close it by day or night. He knew of cases where great benefit had been done by this simple expedient. Then as to closet arrangements. He had had to inspect Windsor Castle, and there one would imagine, if ever there was perfection to be found, it would exist where Her Majesty had to reside. In 1821, Parliament voted £500,000 to fit Windsor as a place of residence for George the Fourth. Up to the end of William the Fourth's reign he found that £750,000 had been expended upon the Castle. When the Queen had come to occupy the throne, and in the year 1844, the state of the Castle had become so bad and was so offensive that it was almost impossible to live in it, and it was found upon examination that there were no fewer than fifty-three cesspools within the basement, all of them full and overflowing. It took some years to remedy the evils that existed, but they had been overcome, and now probably Windsor Castle was one of the healthiest places in the world.

Mr. J. BRIERLEY, C.E., Blackburn, said the subject divided itself into two parts. One was the public duty of amending the sanitary condition of the dwellings, and the second was the public duty of informing the population, by every means in their power, of the principles of science in sanitary matters. Local bodies were not always to blame, he maintained. People well-to-do were often found living in houses of a wretched character, when they could get better houses for 6d. more a week. He advocated for the national health a central authority, that would not only look after the large centres of population, but would take cognisance of the whole country, from one end to another. The want of sanitary knowledge, he held, was not confined to the poor.

Dr. BAYLIS (Birkenhead) believed that the crying evil of houses was that no proper provision was made for dealing with that serious element that could spread disease, death, and sickness. That was to say, we required proper provision for the disposal of excrement. Was it not a small thing to call upon the Legislature to see that this residue substance was disposed of in such a way as to promote the health of the inhabitants? No houses should be built without proper provision for conveniences, receptacles for ashes, &c., and a yard in the rear.

Mr. G. WILSON really believed that the cure for bad houses would be to hang up all our architects like bundles along our streets. Until we did so we should never have any decent houses. It was all very well to say people should teach sanitary principles to those who were ignorant. He came down to Leeds, one of the leading towns of England, and when the sewage question was discussed, one gentleman, a member of the local authority, said that he had learned nothing. And the town had adopted a scheme of dealing with sewage that was denounced by the highest authorities on the question. Yet the scheme was spoken of by one gentleman as the best that had been propounded. Well, when gentlemen of our leading cities talked like this, how could people go among the poorer classes, and pretend to be learned and well informed? Little progress was made in these matters just because people

would not listen to the few persons who were able to give advice, and just because our Legislature was so occupied with party struggles that it could not attend to the health and the decency of the nation.

Mr. Councillor GALLSWORTHY defended the action of the Town Council of Leeds in adopting the A B C system of sewage utilisation; and, with regard to buildings, the local acts gave Leeds, he believed, sufficient power to see that proper accommodation was given. Improvement was being carried on in the town, and he knew it was the intention of the Council to destroy the whole of the worst houses that existed. There was, however, a power to prevent required as well as one to destroy, and the Buildings Committee had thought it wise to get extended powers so as to prevent the erection of houses in any old courts. At the present time the town had not the power to prevent the erection of buildings in courts.

Mr. RAWLINSON, C.E., wished to offer some advice as to the condition of Leeds. He had had the opportunity of holding an inquiry in Leeds, and of turning his attention to some of the sanitary defects that existed, and he had pointed out previously what in his opinion would have been a remedy for one of these defects. Again he wished to point that out, and enforce it with all the emphasis he could apply, because it would not cost much. Leeds had already been sewered. He might say there were sewers through the main streets, and some of the tributary streets also. The system was not complete. The sewers were not ventilated at this moment. The houses were connected with these unventilated sewers. He could assure them that this was one of the elements causing the excessive mortality of Leeds, and he pleaded with the people of Leeds to make the openings up to the streets as they were made in London to let the gases come up at as many points as possible, and the atmosphere would dilute the gases and render them innocuous. Then some of the streets were paved; others in the suburbs were not paved at all; and Leeds should not permit its population to be dragged down by the miserable condition of any street. Even streets in the heart of the town were in a bad state. For instance, the street in which was the office of the friend (Mr. Fenwick) with whom he was staying: anything more disgraceful than the pavement of that street was not to be seen. It was a paved street, full of ruts fit to break any springs that might go over them. It was no economy to leave a street in that condition, and he urged that the work of repairing such streets should be commenced at once. If the town had not the money, it should be borrowed; if it had not the power to borrow, then, in the name of goodness, let the town go and get power.

Mr. FOWLER (Borough Surveyor of Leeds) said that since Mr. Rawlinson had been in the borough the sewers had been ventilated to a very great extent. In fact, the north-east district of the town, where the death-rate was the highest, was now ventilated by means of direct openings, and charcoal trays were used to disinfect. Ventilation was also effected by means of communication with the chimneys of manufactories. In the north and north-east wards the five miles of sewers there laid down had had well on towards 100 ventilators put in. He held that Leeds was better paved than any town in England. No town had so many paved streets for its area as Leeds had; and Park-place, the street alluded to by Mr. Rawlinson, was one of the best streets in the town so far as area was concerned. He admitted there might be holes in the street, but when the Corporation were paving 100 streets annually, and were employing all the contractors they could, and when there were back streets to improve, they might very well be excused if some things were not done.

Mr. RAWLINSON had no desire to censure the town of Leeds. He commended the water supply of the town, and did not see why, in sanitary matters, Leeds should not also take up an advanced position. As regards the A B C works, the experiment would not be void of results, as it would remove the solid from the sewage.

Mr. E. CHADWICK said that so certain had sanitary science become that a person might undertake to contract for results. In the town of Leeds a person might contract to reduce the mortality one-third.

HEALTH OF OPERATIVES IN FACTORIES AND WORKSHOPS.

THE special question for discussion by the Health Department of the National Association for the Promotion of Social Science on Monday was, "What are the best means of promoting the health of operatives in factories and workshops?"

The first paper was read by Mr. J. H. STALLARD, who said the question for discussion was precise, and narrowed down to what took place in the workshop. The chief point was whether the air supply was pure; and he maintained that the death-rate and the kind of disease existing proved that the air in many cases was impure. A sufficient supply of air was capable of reducing the deaths resulting from pulmonary disease, and this fact he illustrated by a reference to improvements that have taken place in barracks to secure ventilation. Having contrasted the conditions under which the town artisan carries on his work with the conditions under which the agricultural labourer pursues his calling, he contended that man is made and constituted to live in the open air, and not in a box. People who were employed in towns were obliged to be fed more expensively than they would be if isolated in cottages in country districts. There was no doubt in the world we could produce a more healthy race by a less amount of expensive food than we could, by the very best food, produce in large aggregations in towns and large establishments. We should seek to employ our people in the open air. The real stamina of the country, after all, came from the agricultural element, and that was due principally to the fact that those people worked wholly in the open air. We wanted to establish the principle that factories and workshops should be so constructed as to assimilate the condition as near as possible to that of the open air, with provision only for protection against rain falling and violent draughts. To protect ourselves from draughts and rain was all that we really required. All ventilation proceeded under the supposition that only a certain amount of air was required, whereas the true air supply we needed was only to be obtained by living in the air. He exhibited a diagram of an improved method of ventilating hospitals, public buildings, and dwelling-houses, and in speaking of it said that if we wanted to place our workshops in free contact with the open air, we should be compelled to adopt the principle of numerous small openings, and must rely upon the laws of diffusion and connection for a sufficient and complete interchange. That was, we must protect our apartments from the direct pressure of the wind, and yet provide a large surface with which the communication with the outer air should be free. Laws of diffusion and connection were sufficient to insure interchange even in the stillest atmosphere, if only we gave them sufficient opportunity for acting, and the problem was thus reduced to the question as to the largest surface of our room sides which might be perforated by innumerable small openings, so placed as to be free from any outside pressure of the wind. Of course we could not perforate any of the sides, and we had only the top and the bottom. It would be expensive and difficult and useless to perforate the floor, and thus we were driven to the alternative of perforating the ceiling. If we protected this perforated ceiling from rain, and exposed it nowhere to the direct pressure of the wind, we had succeeded in placing the workroom in free, complete, and immediate contact with the outside air, and we should have given the principle of slow diffusion full play. No great volume of cold air could possibly be driven down on any side of the apartment, whilst the freest exit was provided for the warm and vitiated exhalations from the lungs and body and for any unwholesome products of the manufacture carried on. There was no disturbance in the atmosphere of the room sufficient to interfere with the natural rising of the vitiated products to the ceiling, and in the plan he had proposed there was nothing to prevent the escape of those products in the air chamber, from which they were at once carried away by the horizontal current passing through. The arrangement was simple. Every room should be provided with a double ceiling, the space between being in free communication with the outer air on all sides. The top ceiling was either the floor of the room above or the roof—the lower ceiling was made of finely perforated zinc, or oiled paper. The air chamber should be large enough to admit of being swept out from time to time, and the sides might be made of perforated bricks of various colours and shapes. This plan did not interfere with the employment of opposite windows and ordinary means of warming rooms. The sole object was to maintain the principle of living in the open air, under all conditions, whether in winter or summer, day or night. It was beyond the control of any one to cut off the wholesome and necessary connection. It was a principle which, in his judgment, was as necessary in a bed-room as in a drawing-room, and as necessary in a factory as in a hospital. It was a principle which had been ignored by architects since the Roman era, but he would observe that the courts of the Pompeian house were but a more open arrangement than the one proposed. He believed that the best means of im-

proving the health of operatives in factories and workshops would be to place them in direct communication with the open air by the plan proposed.

Mr. P. H. HOLLOND held that the benefits sought by Dr. Stallard could be got without the sacrifices proposed. As the best means of ventilating he recommended warming the air with the waste heat before it is given off.

Mr. LEIGHTON (Liverpool) said the simplest and most effective system of heating and ventilation he had ever seen was in a school-room at Glasgow. The whole of the exhausted air was taken away by the draught caused by a fire on the lower floor, the school being on the second floor, and the air being conveyed to the lower room in a tube from the ceiling. The supply of fresh air was by means of a perforated pipe, which pipe conveyed the air to a boiler heated by the fire, and there the air was warmed and conveyed back to the school-room.

Mr. Alderman BENNETT (Liverpool) said that if any one went into the Council-room at that moment he would see the necessity of some system such as Dr. Stallard had mentioned; and, so far as the last speaker had gone, his system was insufficient on a large scale in order that that rapidity of change might be secured which was necessary. It was very essential that the means for ventilation should be most ample. He was not quite sure that the method suggested by Dr. Stallard could be applicable in all cases, but the question was a very serious one, and one which he feared did make the great distinguishing feature between the health of the agriculturist and the health of the town man.

Dr. STEWART (London) said that by this plan, to provide by small perforated plates for the diffusion of the air, we might secure its introduction with very great facility.

Mr. RAWLINSON, C.E., recommended the suggestions of Dr. Stallard to the serious consideration of all persons having anything to do with men crowded either into workshops or into houses. There was no artificial remedy, there was no fine-drawn remedy of flues or valves or other means of that class that would give fresh air in the abundance that appeared to be necessary for health. They were probably aware that he had been sent out by the Government to the army in the Crimea, and out in the Crimea there was certainly room for an experiment upon the grandest scale. The mortality was something more fearful than had ever occurred with any army with which he had been acquainted. Our troops in the Crimea had suffered in the three months during the dreadful winter of 1854-5 at the rate of 700 per 1,000—70 per cent. during those three months. They saw starvation of various kinds—from want of necessary provisions and starvation from actual exposure to the elements. The remedial measures that were taken in the first instance were to send out a number of huts from England, at very great cost, in lieu of tents; but these wooden houses had no sooner been inhabited than they became fever dens and pests of the very worst kind. And for this reason. No instructions were given to provide isolation of each but from the subsoil and to provide ventilation. The side walls were 8ft. high, and the roof was covered with patent felt, which was waterproof; but, unfortunately, it was airtight too, and there being no arrangement for any ventilation at the floor, and the huts being arranged for twenty-five men, one-half of the occupants were down in fever, and sometimes it turned to putrid fever. There were some regiments with only one-half of their strength. The 79th was down with fever, and a most striking condition of affairs was found out in comparing the position of the 79th with that of the 42nd Regiment. Lord Clyde had gone with him for the first inspection, and he asked to be told the difference between the two regiments, there being very little fever amongst the 42nd. Upon investigation he found that the encampment was on a steep mountain side, the greater part being oolitic limestone and dry, but there was a broad band of clay underneath. The 79th Regiment was on this band of clay, and the persons erecting the huts had excavated a level place into the bank of the hill-side, and, consequently, at the back it was three to five feet in height, sloping down at the sides; and no provision being made to keep the earth from the sides of the huts, they were like inverted bell receivers, with the men inside, and the damp soaking in under the floor. The 42nd, on the other hand, were on the rock, and they had been compelled to raise a false floor for the huts. He advised the shifting of the regiment, and from the time that it was shifted the new type of disease ceased, and only the men had to recover who were originally down. The huts, however, on this band of clay were not taken down. The quarter-master forgot that they were empty. The 32nd Regiment came from India and was quartered in them, and when they had been

there fourteen days, there were thirty-two cases of cholera. The wretched huts were still kept there, and a brigade of artillery having been sent into them, within thirteen or fourteen days there were thirty or forty dead with cholera. All this was simply want of ventilation and proper sanitary provision. As to day and night atmosphere, we in this country were not so much afraid of ventilation as the people on the Continent. On the Continent—in France, in Germany, in Italy—there was nothing people were so much afraid of as open windows; and the common remark if an open window was seen at night was "There is some fool of an Englishman living in that house." He did think there was something of the bugbear in what was said of the difference of temperature between night and day. If we could keep patients out of a direct draught, if we could keep them well clothed with the bed-clothes, no harm need be apprehended. As Miss Nightingale said, What could we have but night air? and how could we injure patients by night air? There was either the atmosphere around, or an artificial atmosphere of a most abominable character that was concocted by ourselves. We knew that travellers out in the east had a scorching sun, a tropical sun, on the sandy plains of Arabia, and the largest rivers were frozen over at midnight. Now, we had never heard that travellers there had suffered from the variation of temperature, and he himself had been in a country where, marching during the day, they had a temperature in the sun exceeding 120 degrees. He knew he had to march with his coat off, and was perspiring from every pore. He had no shelter at night but a thin piece of cotton, and yet he saw one inch thick of ice frozen on the river at night. He had always been considered a very delicate man, and although he did not say we could submit patients to a difference of temperature such as that, yet it only showed how wonderfully the human constitution would adapt itself to circumstances if we give it fresh air. Pure, uncontaminated air must be got in, and let in and out in profusion, or we could not have that health which was necessary.

Dr. STALLARD, in replying, said his system did not interfere with warming a room or building in the slightest degree. The proposal was the result of long deliberation, but it had only been matured within the last few weeks, and it had not been practically tested. He had the promise, however, that it should be fairly submitted to test. There was no danger whatever from the night air in any moderately well-placed building; provided, for instance, in hospitals the patient was covered up sufficiently. One medical man treated fever very successfully by taking the windows out of his building altogether, and if that was the case where the rain might beat in, what might not be expected from a system such as he had detailed?

THE ARRANGEMENT AND DECORATION OF THEATRES.

WE last week summarised some remarks on the construction of theatres which had appeared in the *Athenæum* of the previous week. The same writer, in a second article, says that there are two distinct modes of arranging an auditorium, the French and the Italian; the latter of which may be recognised by its sombre rows of pigeon-holes, inexorably straight, square, and regular. According to the French fashion, the partitions between the boxes, although high at the back, are gradually cut away as they approach the line of balustrade, conveying the semblance of a continuous and uninterrupted gallery. By this means an air of animation is attained, which is looked for in vain in examples of the Italian arrangement, for the audience is placed in light instead of shadow. The only serious disadvantage of the French plan is the impossibility of the occupants of the boxes or balconies withdrawing themselves from the public gaze to the extent possible under the "pigeon-hole" or Italian plan. This disadvantage will, however, be obviated in the new Parisian Opera-house by the addition of a small retiring-room to each separate private box. Every box will also be placed on two levels; the lower one for the occupants of the front row, the higher one for the persons whose seats will be behind them. M. Garnier considers this a felicitous arrangement; but the utility of the innovation is questionable, for in all probability no conversation would be possible between the occupants of the seats on the two levels without their voices being raised to a pitch which would be prejudicial to general comfort; neither could the seats be moved about at will. M. Garnier proposes to divide his stalls into triangular sets, so as to allow free access to the seats; but the advisability of this arrangement is also doubtful, for the space lost thereby might be more profitably employed, thinks

M. Garnier's critic, in widening the distance between continuous rows of seats, and the number of square feet sacrificed would serve the purpose of passage-way, besides giving to occupants of the stalls more room in which to stretch their limbs.

As regards decoration, greater scope is given to the artist by the French than by the Italian method of arranging the auditorium. In the former case the lines are varied, and undulate differently on each tier; whilst in the latter case the monotonous evenness of every row renders inevitable a repetition of similar pillars and similar draperies from floor to ceiling; and besides, the eye is fatigued by a sameness of shadow throughout the house. It is erroneous to suppose that the colouring of an auditorium is to be left entirely to the taste of the decorator. Certain axioms may be laid down which will reduce his individual responsibilities within very narrow limits. The auditorium consists of a foreground and background, the one formed by the pillars and balustrades, the other by the partitions in rear of the spectators. The foreground acts also as a frame to the various groups of persons assembled in the boxes. That this frame must be pale in colour is evident, for it catches the light from the chandeliers, and is an important element in the general gaiety of the picture. Moreover, it must be distinctly separate from its background, and were it to be dark that background would need to be light, an arrangement which would throw the occupants of the boxes into shadow. This is of course impossible. The background, then, must be dark. The colours of the spectrum are thus disposed: violet, indigo, blue, green, yellow, and red. Dark violet and indigo light badly, and must be rejected on account of their blackness. Pale violet appears either blue or red at night, according to its tone. A yellow background would appear light instead of dark, and must also be rejected. Blue, green, and red are the only available colours for our purpose. We must seek for something which will enhance in the highest degree the most important feature in each box—the ladies which it contains. At the first we might be led to choose the nearest approach to a complementary colour, viz., an amalgamation of violet and green. But an individual head is relieved against its background by variety of shadow, and therefore independent of the law of complementaries. We must accordingly seek for a safer Mentor, and shall find our guide in the law of reflexions; nearly all bodies are more usually lighted by a reflected than by a direct light. The colour of all others most likely to produce by its reflexion an aspect of health and freshness, as well as a warmth of shadow, is indisputably red, and red is the only colour which will achieve that result. As regards material, we are reduced either to damask silk or a flock paper, for paint is unpleasant to the touch, and we are forced to put aside any stuff or polished surface which will destroy the general repose by a shimmering reflexion of white light. The decorations of the recently-opened Lyceum Theatre will supply us with a case in point, for the exceeding hideousness of these attempts at novelty is due to a direct violation of the foregoing rules. The foreground is sombre, and of a colour which by gaslight is neither green, blue, nor violet, while the background of the whole is of a polished white, rendered still more objectionable by an effete and spidery attempt at diapered pattern.

THE WASTE OF WATER.

MR. P. H. HOLLOND read a paper on Monday, at Leeds, before the National Association for Promoting Social Science, on a cheap mode of preventing waste of water when continuously supplied. The waste of water, he said, chiefly arises from some consumers allowing many times as much water to run away as they use, with the effect commonly of making the average quantity supplied exceed three or four times (often much more) the average quantity used. The remedy proposed was to supply each house with as much water as would be fairly used and not much more. Five gallons per individual, or 25 gallons per house, was considerably more than was likely to be used per diem; but on washing days twice that quantity might be needed. This quantity might be supplied through a mere pin hole, discharging at the rate of two gallons an hour, and might be conveyed through a pipe a tenth of an inch in diameter, running very slowly, and therefore with very little friction. To avoid the inconvenience of having to wait for such a slow discharge a small receptacle, large enough to hold as much as would be wanted at once, would be needed. The advantages of economising water were commented upon.

Mr. RAWLINSON, C.E., said that they could not have fine-drawn theories about water supply. There must be water in abundance, in spite of that which theory suggested.

Mr. E. CHADWICK considered that in this case much might be learned by inquiries from persons outside the profession. He thought receptacles for the storage of water were liable to objection on account of the water losing its freshness in them.

Mr. B. LATHAM also thought the storing of water for dietetic purposes an error; and as a means of preventing waste of water, he recommended Hall's system, to be seen at the Sanitary Exhibition.

Mr. Alderman BENNETT said that if there was a town in which, if practicable, Mr. Holland's plan could be adopted with advantage, it was Liverpool. He considered it one of the suggestions that might be worked up by engineers.

Mr. FILLITER, in closing the discussion, said he knew of no reason why any family should be allowed to use hundreds of gallons more than was needed. He did not know why they should treat water upon a different principle from that on which we treat bread or anything else, because when it came into a town water was a manufactured article, and a very costly article too. That the constant supply system must be adopted not only in London and Liverpool but in every large town, no one was more convinced than he was, and he had had some twenty-five years' experience in the conducting of both systems. He asked why the meter system might not be introduced under proper regulations? It was said that the meter system would lead people to use as little water as they could help, and thus encourage dirtiness; but it might easily be so managed that every house should be bound to pay a minimum rate, say 5s. or 10s., and should be entitled to pass through its pipe a minimum quantity, say 10,000 or 20,000 gallons. If a man consumed more, then he should be compelled to pay an extra rate for the excess. The difficulty was as to the construction of the meter. Even at the present moment they could scarcely say they had got a meter that they could entirely depend upon for water. But they had only to give encouragement to manufacturers to have these meters put into excellent condition, and such as they could adopt with ease. The meters were now low in price, and he thought that they would be both lower and more correct soon. Five gallons a day per head he thought too small a quantity, and his own experience of this matter suggested seven or eight gallons per head. He should let people have an ample supply of water for all their reasonable purposes, and he would only exclude—as he should do rigorously—that abominable waste which takes place in all our large towns.

THE LESSON OF THE GREAT FIRE AT CHICAGO.

THE terrible fire which has destroyed, according to present accounts, buildings covering five square miles in the city of Chicago, and rendered homeless over one hundred thousand inhabitants, should make us look well to our defences against this most merciless of enemies.

We are not aware what facilities Chicago possessed for the extinction of fire in the shape of a fire-brigade. Probably, like those in many of the large American cities, it was based on the volunteer system, and not very remarkable for efficiency. In this respect, in spite of the occasional vagaries of its directors, such as drafting all the men and engines to one spot for the amusement of royal personages, and the confusion of the inhabitants of the unfortunate locality selected, we probably have the advantage. Fire-engines, however, are quite useless without water, and we direct attention to a suggestive letter in the *Chicago Tribune* of the 27th ult., only ten days before the fire, in which appears a long letter, complaining of the inadequate water supply. "Your remarks," writes the correspondent to the editor, "the other day on the scant supply of water in certain districts of this city were timely and just;" and adding, "I am one of those unfortunate individuals who live outside the favoured circle, and am compelled to resort to various devices to obviate the inconveniences complained of." Further on he says:—"There has been, it seems to me, either a stupendous engineering blunder in not providing ample mains for conveying water through our streets, or there is a prodigal waste by those living near the source of supply, amounting to criminality. In either case, the Board of Public Works owe it to the community to furnish a full statement of the facts, and also to devise a remedy."

The letter is accompanied by the following editorial "remarks":—"A reporter of the *Tribune* yesterday called at the office of the Board of Public Works to ascertain the cause of the present small supply of water in all sections of the city, and was informed that it was occasioned by the getting out of order of the two largest engines at the Water Works. All

the water now supplied our citizens has to be pumped by the smallest of the three engines belonging to the city—an engine of only 450-horse power. During the summer months the two big engines, the one 1,200 and the other 600-horse power, were run up to their full speed, both night and day, and even then there was great complaint among the people who live in remote parts of the city of a scarcity of water."

It will be remembered that one of the principal disasters mentioned in the telegraphic intelligence of the past week is the destruction of the Water Works. We wait with some eagerness to know how this unusual calamity occurred; but whatever its cause, it is very evident that Chicago, so far as her water-supply was concerned, was but ill-prepared to contend with the enemy who has destroyed her. Are we much better off? The great Western city, which, in the marvellous rapidity of its growth astonished even Americans, will doubtless soon be rebuilt with a corresponding activity. More attention will be paid to the means of contending with fire. In other respects, in the long run, the city, like London, may be rather the better off for the calamity which has overtaken it. We had long ago one of such "blessings in disguise," and although could we but select our own quarter, and comfortably remove, and house elsewhere the inhabitants beforehand, we might not regret another such visitation, yet, as fire has an uncomfortable habit of overleaping set boundaries, and devouring alike that which we would gladly surrender to it, and that which we value, it might be as well to look somewhat carefully to our means of subduing it, and to remain contented with our present slower, but less dangerous means of removing eyesores and nuisances.

EAST FRONT, ACTON BURNELL.

THIS is an interesting late example of Early English architecture, and is remarkable for its massive dignity and simplicity of detail. There is an illustration of this front in Rickman's "Gothic Architecture," which does not do justice to its detail and proportions. Seen in elevation, it has rather a stunted appearance, but in perspective this is agreeably corrected. The point of view is an important matter in judging any architectural work, and too much care cannot be used in securing a favourable station point, as the changes it effects are very surprising. We are not too rich in these examples of Early English, and can ill afford to have the few that remain mutilated or destroyed. The present example has been much battered and broken, but enough remains to indicate the entire work.

W. H. LOCKWOOD.

LYTHE HILL, HASLEMERE.

FOUR weeks since we gave one view of this building, and promised to give another and a plan. This week fulfil the promise. The house is built of red brick of a fine quality and colour, the corners being of moulded brick of the same make, and the windows and dressings are of terra-cotta, supplied by Mr. Blashfield, of Stamford. The roof is tiled. The staircase, the panelling of the hall, and the doors are of oak. The architect is Mr. F. P. Cockerell, and the contractors Messrs. Hayward Bros.

REFERENCE TO PLAN.

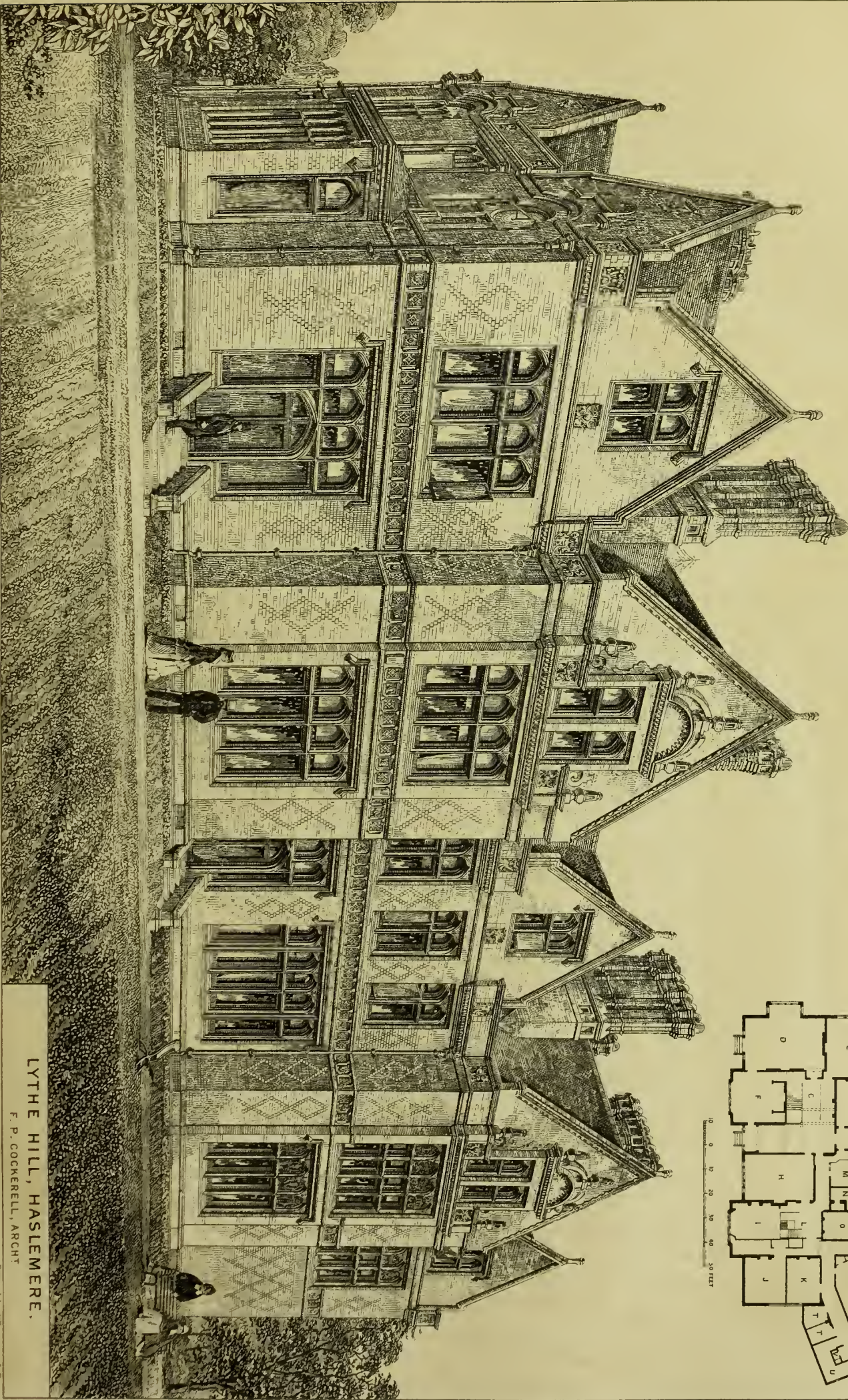
A. Porch; B. Vestibule; C. Hall; D. Drawing-room; E. Billiard-room; F. Library; G. Smoking-room; H. Dining-room; I. Morning-room; J. Servants'-hall; K. Housekeeper; L. Back stairs; M. Butler's pantry; N. Butler's bedroom, with plate closet; O. Still-room; P. Covered way; Q. Kitchen; R. Scullery; S. Drying-closet; T. Footman's room; U. Larder; V. Water-closet; W. Area; X. Archways; Y. To stables.

A LEGAL OPINION OF THE NEW LAW COURTS.—The *Law Journal* devotes an article of some length to a description of the plans of the New Law Courts, and expresses its most unqualified approval of them. "After a careful inspection of the plans, and after the full and lucid explanations of Mr. Street, we are able to state that, so far as the business capacity and accommodation of the New Law Courts are concerned, the most exacting critic must be thoroughly satisfied. We hope that the architecture will please the public taste—or, perhaps, we should say the educated taste of the world of art; but the accommodation, the adaptation of the building for the purposes for which it is to be used, is not a matter of taste, but a matter of fact, and therefore there is nothing presumptuous in our asserting that in respect to convenience the plans of Mr. Street leave nothing to be desired."

EAST FRONT.
A. COTTON · BURNELL.
SPROPSIDE



PLAN OF GROUND FLOOR.



LYTHE HILL, HASLEMERE.

F. P. COCKERELL, ARCHT

Printed by Whiteman & Bass

A RETROSPECTIVE GLANCE AT THE INTERNATIONAL EXHIBITION.

THE first season of the International-Exhibition-Association has closed—closed in the strictest and baldest sense of the word. There was no ceremonial on the occasion, as in 1851, when the Royal Commissioners, with Prince Albert at their head, held a solemn meeting to receive at the hands of Viscount Canning the reports of the juries, and when eongratulatory addresses were delivered upon the results of the Exhibition. We suspect, however, that a farewell meeting between the managers of the Exhibition of '71, and their clients and the public at large, would not have gone off so pleasantly as that of '51, it being but too notorious that all is not *couleur de rose* at South Kensington. So the firm of Cole, Scott, & Co., perhaps, did wisely to shut up shop with as little fuss as possible, closing the doors of the ugly, straggling buildings as soon as the last of the visitors had turned their backs, and then proceeding to count up the shillings. And we believe we may say that, in a financial point of view, the first season of this new mixed enterprise—half bazaar, half music-hall—has been a decided success. The Royal Commissioners' little puffing organ, "The Key," which was published by themselves, for their own purposes, in their own building, announced in July last that the amount received, one way and another, up to the end of the eleventh week—being exactly half the announced duration of the season—"considerably exceeded the sum necessary to pay the working expenses of the whole period of the Exhibition, and still left a balance; so that whatever might be the receipts for the next eleven weeks, they would be all so much to the good for continuing and improving the series of exhibitions of the next nine years." The estimates of the Commissioners appear to have been based upon the calculation that five hundred thousand visitors would attend, paying one shilling each; but the actual number of visitors in the first half of the season was somewhat over 570,000, and the total number during the whole season has risen to about double that figure; so that we may safely consider that the Royal Commissioners have now a balance in hand equal to the whole estimated working expenses of the season. Of course we do not know the exact figure either of income or expenditure, nor, perhaps, ever shall, the Commissioners not being compelled under their charters to report oftener than they think proper. Speaking offhand, however, and at a guess, we should perhaps be not far wrong in putting the net profits of the season down at some thirty or forty thousand pounds. This is a large sum of money to get out of the free contributions of the public, and if applied judiciously in the promotion of education and the various industrial interests of the country might do a great deal of good. But, in truth, have we any sufficient ground to believe that such will be the case? Are there not, on the contrary, too many reasons for the apprehension that the very enterprise out of which this profit has been realised may have done more injury to trade, to industry, and to education than the money is worth; and that, if carried on continuously from year to year on the same system, it may become an absolute mischief, discouraging and repressing rather than promoting and supporting the independent industrial enterprise of the country? The papers have teemed lately with complaints of the favouritism, and the something like jobbery with which the interests of exhibitors have been tampered with, and the injurious and unjust competition which the whole affair has created against the non-exhibiting members of the trading community, particularly of the metropolis; and it seems impossible that such complaints should continue to be made without inducing some measures of redress. Irrespective of questions of commercial

policy, there are several features in the management of this royal and quasi-international institution which inspire distrust amongst the public, and more especially in those whose contributions it invites, and to whose interest it pretends to minister; and the first and foremost amongst them, and perhaps that which lies at the bottom of all the others, is the constitution of the directing body. Although the Royal Commissioners of 1851, with the Prince of Wales at their head, are nominally the managers of this affair, it is pretty well known that the whole practical conduct of it is in the hands of a small clique of self-created philosophers and *cognoscenti*, with Mr. H. Cole, C.B., at their head, and that nothing that does not come within their views, or suit their little plans, has a chance of fair representation amongst them. Now this sort of thing would be all very well if it was merely a question of an occasional fancy fair, or amateur performance for the benefit of some distinguished charity; but when it comes to an organised scheme pretending to patronise, judge of, and to some extent to regulate all the industries of the world, practical men whose lives and fortunes are involved in those industries will not be content to submit their chances of success in their several callings to the arbitration of such men as constitute the various councils and the official staff of this establishment. There are few men who, as the result of a long life's experience, know the difficulties and the nice arcana involved in their several branches of productions, who would be content to abide by the awards of the greater number of the persons who have been appointed as "reporters" on the Exhibition. Again, the committee of selection, appointed out of the self-same fraternity of the school of Cole, Scott, & Co., how may their caprice have operated to the utter suppression, without appeal, of any man's industry which did not happen to suit their fancy? And how must the injustice thus perpetrated serve to discourage the tender of objects for the exhibitions of the future, particularly if of weight and bulk, and coming from a long distance? We have a signal illustration of this, and of the general unwillingness of foreigners to participate in this so-called "International" display in almost every one of its departments—indeed, the "reporters" themselves repeatedly complain of it. In the woollen department, most notably, itself one of the chief staples of the exhibition, there were scarcely any contributions from abroad except those sent by heads of states, or governmental authorities; and to such an extent must the imminent deficiency have made itself apparent to the executive, that the representation of the manufactures of more than a dozen foreign states, Prussia, Saxony, Bavaria, Switzerland, Spain, Portugal, Sweden, and others, had to be made up by lots of goods exhibited, as the catalogue informs us, by "the Royal Commissioners of the Exhibition of 1851" themselves, and which had been probably purchased by them for the purpose.

But a more serious ground of complaint remains behind, in that depressing obscurity which too generally envelopes the interests of the humble labourer. "*Sic vos non vobis*" sung, despondingly, the poet of old. The principle is still in operation; the ingenuity and mind-work of the employed, because he works for hire, goes too often to the credit of the employer, to the increase of his resources and the strengthening of his position. A promise was held out by Mr. Cole that in the International Exhibition this injustice should be done away with, and that as far as practicable the name of the actual producer of objects should be given, as was done at the Working Men's Exhibition. This promise, however, has not been redeemed, excepting in the departments of Fine Art, and already remonstrances, half-stifled, have made themselves heard on the subject.

OMICRON.

LIVING MODELS.

WE read with a mingled feeling of joy and disappointment a report of the inaugural lecture delivered at University College, London, by the newly-appointed Slade Professor, Mr. Poynter, A.R.A. It is always a dangerous experiment when practical artists are chosen for the theoretical branches of art teaching. The inaugural lecture of Mr. Poynter serves to prove this assertion. The practical artist loses his ground at once when he attempts the office of a theoretical teacher or of a philosophical critic; he is generally in want of that perfectly serene mind which is necessary for the decisions of the theoretical generalisation. The painter, the poet, the orator, the musician, and the stage player often evince taste or even genius in their productions, but are totally destitute of the power of abstracting reliable theories in matters of taste and art. The practical artists are blinded by their own special talents. The historical painter looks down upon the landscape painter, who again looks down upon the animal painter, who again feels his eyes obscured by jaundice when he contemplates the works of an ornamentist. The artist who is for the harmonies of contrast rather than the harmonies of analogy looks down upon his antagonist with the same contempt as the latter on the former. The practical artist has often a crotchet, the outgrowth of his individual talent or the consequence of a peculiar disposition of his taste, and tries to force this crotchet upon everybody else as the only safe means to become an artist. Mr. Poynter has done this, for he says in his inaugural lecture: "The living model is to be of the first and paramount importance, and the study of the antique is to be put in a second place." The cart is to be placed, in the art teaching of University College, London, before the horse. Art has had its phases of historical development which cannot be ignored. The Greek sculptor had certainly first living models to look at before he succeeded in creating his immortal models of idealised beauty in statuary. With us this is and must be different. The study of the living model can no more form the basis of our art teaching, for this would be an anachronism. If Mr. Poynter cannot give us at the same time the Greek land and the smiling sky under which natural beauty developed itself to the highest point; if he cannot give us the Greek gymnasium, with its excitement, the intense æsthetic enthusiasm with which people looked on the human form as the most glorious creation of the forces of nature; if he cannot give us Greek public games, "in which supreme physical perfection was crowned by an assembled people;" if he cannot give us judges who will acquit a woman, dazzled by her nude charms, his "paramount importance" of the study of living models will be a mere farce. What is to become of a young student of our times, with our notions of propriety, who, not yet acquainted with the ennobling sentiments of beauty, has to gaze on a living model? Is he, *ab ovo*, to go through all those disturbing influences and trials through which humanity had to pass in its early youth, till wild passions were conquered by a clear understanding of idealised beauty? Will it not be more logical to make the student first acquainted with those finished models of the human form which art has already hallowed by its touch, than to force the young mind to stare at models who, with all their naturalness, exquisite muscled, and fine forms, convey no impression to the student but that of rude nature? We often had occasion to refer to the mistake which the materialistic school of art commits in propounding, "that anything Nature has done is beautiful." This apothegm is altogether false. Nature is to be only the stuff, the clay, the material, the rough marble which the artist has to use up, to transform, to model, and which he has to

vivify with his ideas. The first duty of schools is to cultivate the mind, and not to make the student acquainted with the mere forms of living bodies. When the student approaches living models he must be already well trained in the capacity of reproducing round forms on the flat, and must be freed, in looking at nude forms, of all secondary thoughts through a refined study of the antique. He must be capable of being above rough nature. The training of a young student cannot begin, from psychological and physiological reasons, with the study of life-forms; this would be in art teaching nothing more than practically putting the cart before the horse.

Art schools can have only a two-fold aim, if they are to be of any use at all. First, to develop the reproductive faculty in the artist to enable him to express ideas in forms. Second, to furnish his mind with subjects which he may reproduce if that faculty has been developed. This two-fold aim can easily be combined by a judicious process of teaching. There is no difference between art teaching and the teaching of sciences. We must have first the means to express thoughts, and then we must be furnished with ideas. It would be utterly useless to teach a student English grammar from John Stuart Mill's work on logic. Art schools have to give the students every opportunity to cultivate their talents, to enlarge their minds, and, in case of having the required genius, to gather ideas through sound generalisation, leaving all specialities to the particular inclination of the individual. An art school which begins with the solemn promise to neglect the study of the antique and to go in for the paramount importance of the living model, commences art education at the fag end. We crave too much for a chequered originality. As soon as we set foot on the Continent we distinguish ourselves with eccentric peg-top trousers, wide-awakes, monstrous opera-glasses, and a haughty contempt for everything foreign; but we are at once recognised as originals, and to this national vanity we are ready to sacrifice anything. We do the same when we enter the sacred duties of education. To introduce other school-plans would be a disgrace. What do we want a system for, or a culture of the mind, a study of foreign languages, a correct knowledge of history and geography; that is all very fine for dull German or lively French artists. We have our own haphazard way: we are above all things practical. But this way of educating on the field of art is, as far as the general result goes, certainly not the most creditable to our educational talent. For is there a difficulty that an Englishman cannot accomplish? With pride we may answer, No. Is there anything really tasteful that he could not produce? We may again say, No. And still how backward we are in all matters of refined taste, when we compare our products of art with those of other nations. Because we neglect to follow out the plans of education which have been tried for years in Germany and France with the most brilliant success. Because we will not fill our mind with ideas. Because we have so many masters who are ready to ignore the real purpose of theoretical art-teaching, or to sacrifice a systematic instruction to mere practical paradoxes: they either proclaim "ornamental art as high art and pictorial art as a mere falsehood," or they make "the study of the living model a paramount study," and degrade the study of the antique to a secondary place. What is a student who has no conception of art in general, no refined taste, no cultivated historical and mythological knowledge, to do with a naked male model, with a coarse, unmeaning face and big muscles, or with a bland-looking woman, who perhaps exhibits herself to procure bread for her starving parents? By what psychic process will the student turn the muscular man into a Theseus or Orestes, a John o' Gaunt, or

Cromwell? By what means will he see in an elegantly-shaped female model an Andromache, a Penelope, or a Queen of the May? Will he be able to do this if his mind has not been tutored by a strict discipline in the study of art from a higher point of view; if his imagination has not been roused and regulated; if his faculty of perception has not been thoroughly trained so as to enable him to see gods and goddesses where others see only big muscles and strong bones, or a fine skin and round forms? If Mr. Poynter's paradox were true, our students of anatomy ought to be the very best artists; they study the human frame in all its minutest details. Still, as far as our experience goes, we never yet met with a professional medical gentleman who was capable of drawing well the human figure, though he knew every fibre, nerve, muscle, and bone in it. Why should our lecturers, professors, and teachers refuse to go on a certain beaten track? Why are they always on the look out for some sensational paradox? They see that there are flourishing schools of art abroad, in which the antique is studied; but they want something original. They then conclude to have models of their own. They will pick up a Laocoon in the streets. A good old beggar will do; he will have plenty of protruding bones and ribs and a haggard look; we shall find plenty of Aphrodites at ten-and-six per hour. This will be original, attract students, and fill our school. Competition drives these kind of men, without settled principles on the theory of art, perfectly wild. We, however, feel it our duty to protest, in the name of aesthetics, history, decency, and the sanctity of real art, against such crotchets. The living model is only paramount as a study to a very few students who will devote themselves to figure drawing or painting. Why should we make a special branch of art the foundation of general art-teaching? The deficiencies of students who devote themselves to the arts may be sought for in the narrow range of their general knowledge, in the neglect of the study of foreign languages, the literature and history of their own as well as that of other countries; in one word, the neglect of a higher intellectual training before they enter an art school, and, if once there, in the neglect of the study of aesthetics, archaeology, mythology, and art history. An institution like University College, London, ought to supply the students with regular courses of lectures on 1, aesthetics; 2, archaeology; 3, comparative mythology; and 4, history of art. The students ought to insist on the teaching of these subjects, else they will never be able to compete with art students educated abroad, who are well informed in these higher branches of art education. What right have the authorities of any art school to withhold from the striving young student a knowledge of any of the above-mentioned subjects, which form the principal topics of teaching in the art schools of Germany, France, and Italy? Do we really believe that we can produce taste, refinement, and power of composition in our artists and an appreciation of the products of art in the public in general by a process of education different to that followed out abroad? We cannot become mathematicians without knowing arithmetic; we cannot become classical scholars without knowing Greek and Latin; in chemistry, geology, medicine we have to follow out the same training as students abroad; only in art we ought to attain the same results, though we might neglect the above-mentioned subjects. If the students of University College, London, were well versed in those theoretical subjects, living models might be of some use. The paradoxical teaching as proposed by Mr. Poynter will bring out prominently his own paramount crotchet, and make the Slade foundation a mere useless expenditure. The speciality is again to kill the generalisation in order to produce a crippled and one-sided result, altogether contrary to the very name of University College.

We have "a fleshy school of poetry," and do not want "a fleshy school of art" without refinement and higher intellectual attainments in the students. G. G. ZERFF.

IMPROVED DWELLINGS FOR THE WORKING CLASSES.

THE above subject was discussed on Friday last by the members of the Economy and Trade Department of the National Association for the Promotion of Social Science. The special question under the consideration of the section—Mr. William Newmarch presiding—was, "Is it desirable that the State or municipality should assist in providing improved dwellings for the lower classes; and if so, to what extent, and in what way?" The first paper read was one by Mr. Jas. Hole, which, in the absence of the latter, was read by the Rev. H. Solly. At the outset he referred to the great deficiency in accommodation for the poor, and after commending building societies, which, however, it was stated, did not meet the deficiency, he referred to the two Acts passed in 1851 and 1866, the one to encourage the establishment of lodging-houses by the authorities, the other to enable the Public Works Loan Commissioners to lend capital to erect improved dwellings for workmen. The author approved of the principle of these Acts, but contended that the capital lent by the State should be advanced at a lower rate of interest, and that a much larger proportion of the cost of the improved dwellings should be advanced. He recommended that the scale of repayment should be so constructed as to enable those who wished to become owners of their own dwellings, and illustrated the principle by the experiment made by the Model Cottage Society of Leeds a few years ago.

Mr. T. B. SMITHIES followed with a paper referring more especially to the dwellings of the poor and working classes of the metropolis. The paper attributed the success of the Prussian nation to the assistance given by the State for the erection of dwellings by the working classes, and advocated the extension of the Peabody and Waterlow system for London. One thing was essential to the project of working men becoming their own landlords—the law as to title and power of sale must be as simple as the transfer of goods and chattels, so that if working men were suddenly called away from one part of the metropolis to another, or from the metropolis to the country, there would be no barrier placed in the way of a speedy sale and transfer of the property.

Mr. BURHAM SAFFORD, in a paper upon the same subject, urged the necessity of sanitary inspectors being appointed by Government, in order that they might be free from local influence, this officer to be able to survey and advise as to the most available means of drainage and as to the disposal of sewage. Upon the report of such officer that the habitations of the poor were unsatisfactory in number and character, a *mandamus* should be issued compelling owners and authorities, under such powers as exist, to remedy the deficiency. He considered that throughout the rural districts the unequal incidence of local taxation had been detrimental to cottage accommodation or improvement.

The CHAIRMAN said the first paper went right to the question; so to a certain extent did the second; but he was sorry he could not say the same for the third. There could be no question as the desirableness of improvement, and the thing they were about to consider was whether it was desirable that the State or the municipality should assist in providing improved dwellings for the poor.

Mr. W. S. DAGLISH, Newcastle, said he was connected with the Newcastle Improvement of Dwellings Company, which he was glad to say had been a success, for it had declared a dividend of 5 per cent., after allowing a fund equal to 10 per cent. upon the whole capital for depreciation in value. He felt certain 8 per cent. could be realised upon workmen's cottages, and while that could be done there was no need to go to the State for aid. If proper care were exercised, workmen's dwellings could be made to pay. He asserted that the State had already given sufficient and necessary assistance in this respect, and he disapproved of their going to the State to borrow money. As to the question of the municipality assisting the erection of such dwellings, he thought they could not well do so, as in many cases members of corporations felt they were coming into competition with private enterprise. This difficulty had been experienced in Newcastle, and it had been left to private enterprise.

Mr. MORRISON, M.P., did not think it fair for the Government to spend public money in providing parks for London while they compel the people of

Leeds and other places to do it themselves. He declared that they could object to municipalities pulling down the low class of dwellings and replacing them with a higher class; but the greatest difficulty was to prevent "jobbing" among public bodies, more especially with respect to the building trade. If there was no prospect of private enterprise doing it he did not think they should look to the Government. He did not object to the Government advancing money for the purpose, for they could borrow money at $3\frac{1}{2}$ per cent. and could lend it at 4 per cent. This was a sufficient profit, and it would be a great convenience. After referring to the position of the metropolitan companies, he said there were difficulties in the country with respect to dwellings, but it was nothing to what it was in the towns. There was need for some improvement in the law of the conveyance of property. The real obstacle to this was the opposition of the legal interest. So long as we had the present complicated system of conveyance it was vain to expect working-men to invest in property. They wanted some simple and general plan of the towns laid at the Town Clerk's office, sketching out the exact position of each site, where a man could go and see it at once if he wished to purchase. Speaking of the co-operative societies, he said they were making a great deal of money, and some of them, he was glad to say, had devoted their profits to the building of houses for their members.

Dr. GAIRDNER, of Glasgow, said his experience led him to entirely agree with the last speaker. There were, in his mind, great difficulties in the way of the State or the municipality building houses for the working classes in the room of those misplaced by improvements. It would, he said, be wrong for the municipality to build a similar class of houses to those misplaced. In illustration, he said, in the city of Glasgow there were 100,000 houses, 25,000 of which were occupied by persons at a tenancy below what it was possible to construct or hold an ordinary dwelling. The majority of them were below £5, some even £4 10s., £4, and even £3. It was impossible to get any place to accommodate a family with anything like comfort—even if it were only one room—under £5. Supposing some great commercial operation should displace a number of these houses, was the municipality to replace them with a similar class of houses?—a class below the line of sanitary comforts? for if they were not to do so, they could not replace those houses thus removed. The working-class of Glasgow had become so debased by the evil influence of miserable dwellings that they could not rise to the idea of proper house accommodation. The remedy for removing the present low class of houses was to let the working-classes understand that they must raise their notions of accommodation. If such a class knew that the municipality would provide dwellings for them, there would be no end to it. The duty of the municipality was, rather than assist in erection, to destroy these dwellings as rapidly as possible. They should remove them as rapidly as possible, but he would recommend a gradual process. Much had been said as to the advantages of the flat system. He admitted there was a great convenience in it, but there was danger in it. The danger was this—it accommodated a large population upon a small area, and this led to the generation and increase of fever. If they adopted this system, they must do it upon a conditional system. He concluded by repeating that it was the duty of the municipality to pull down the low class of houses as quickly as possible.

Mr. W. T. NEWMARCH said several societies for the erection of workmen's cottages had been formed at Jarrow, near Newcastle. Having referred to the rapid increase of the last-mentioned town, he said there had been a consequent demand for houses. A number of the working men had formed an association, the object of which was to erect dwellings for themselves. Money was borrowed in the name of trustees, and used in building cottages. The system they adopted was similar to building societies, but differed from the latter in the respect that there was no profit. Their system was progressive. They paid 5 per cent. for the money borrowed and 5 per cent. for amortissement, and the dwelling became the property of the tenant in 13 or 14 years. On this system they had erected between 400 and 500 dwellings. The speaker created much amusement by stating that the association painted all its houses alike, and when a man got his house to himself he made it conspicuous by painting it a different colour to the others.

Mr. HOLLOND asked whether if, in those societies referred to by the previous speakers, remuneration was given to the directors or the inspectors?

Mr. DGLISH said nothing was paid to the directors or inspectors in the company to which he had referred.

Mr. HOLLOND observed that with respect to the Peabody buildings in London he never went past them without feeling that the money spent in their erection had been perverted from the proper object of the donor to another object. Around the buildings in Spitalfields there was crowded a dense mass of the low class of population, who, instead of being inside the building were huddled together in its vicinity. On a recent visit to the place, he said, the manager had assured him, with apparent exultation, that there was not now a costermonger or a dock labourer in the building, which fully illustrated what he had said as to the building being perverted from its real object.

Mr. J. HOLMES (Leeds) said they ought to reduce the rental of property beyond a certain point, or it would stop the current of commerce. He thought the association should appoint a committee to procure information upon the subject and draw up a report.

Mr. WILSON, in opposition to the previous speakers, maintained that the only way to procure a higher class of dwellings for the poor was for the municipalities to purchase land and build thereon, and thus check the tyranny of private speculators.

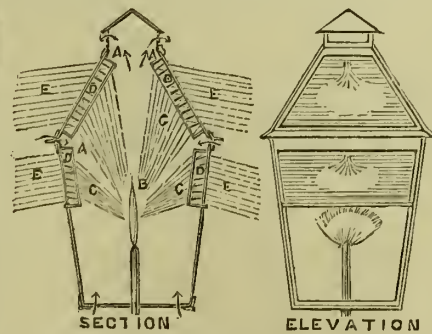
Mr. J. NUTTALL, Oldham, spoke of the good effects brought about by co-operation, the funds of some of the societies having been devoted to the erection of dwellings. The Registrar had held this to be illegal, but within the last five or six months it had been altered, and now they could invest their funds in the erection of cottages. The efforts of every one should be directed to influence working men to join the movement.

Mr. G. POTTER thought the attention of the section should be directed to providing better dwellings for the working classes in the large towns. The real question was how to raise up the working class; they must have help from some source. All that had been given by Peabody had been monopolised by a class for whom it was never intended. A project had been mooted for erecting a block of buildings in the suburbs of London, in which should be placed a market, and a part of the scheme was to have a railway running from it to the town.

The CHAIRMAN agreed with the remarks of Dr. Gairdner. He thought that the Act of Mr. McCullagh Torrens should be made as effective as possible.

NEW METHOD OF STREET ILLUMINATION.

A NOVEL adaptation of the catoptrical lenses already in use in lighthouses to the purpose of street illumination, has just been introduced by Mr. Skelton, of the firm of Skelton & Pether, architects. The inventor takes the ordinary street lamp, and by the introduction of catoptrical reflectors at all sides and on the top of the lamp, increases the illuminating power of the jet threefold. A very ingenious contrivance secures the reflectors from dust, it being simply to inclose each set within glass squares. The illustration given shows this invention applied to an ordinary street lamp, but it may also be applied to lamps of any form, and is suited not only to streets and open air places, but to railway stations, factories, and such like places where the light ascending above the level of the lamp is wasted; it is intended to prevent condensation of vapour within the cases, by artificially rendering the air inclosed perfectly dry, or by inclosing some fragments of quick lime to absorb and fix any moisture accidentally inclosed.



REFERENCE TO DRAWINGS.—A. Cases of reflectors hermetically inclosed between glass plate. B. The brightest point of light. C. The rays of light useless in ordinary lamps. D. The reflectors. E. The rays C reflected into a direction of usefulness.

Messrs. Walker & Sons have at their factory the organ belonging to S. Bride's, Fleet-street. This instrument has long been allowed to remain in its very old-fashioned state as to pedals, compass of manuals, &c.

GOSSIP FROM GLASGOW.

TO serve occasion reasons are as plentiful as blackberries, and "the why is plain as way to parish church." When a new hall is wanted, all sorts of arguments are hurled against the old one. It is inconveniently situated, it is inconveniently planned, it is ugly within and undignified without, it is too small in area and too low in ceiling—like Dr. Johnson's leg of mutton, that was bad from being badly bred to being badly served—it is bad altogether, and to be made at all better needs only to be wholly rebuilt, and in some other situation. One reason that has as yet been overlooked, and that might be thrown in as a makeweight, is the toil, trouble, and expense of adventitious "decoration." "Beauty unadorned's adorned the most," and "Good wine needs no bush;" but upon all great occasions—nor are these like "angels' visits"—the nakedness of our City Hall must be draped with Turkey red, and its "coigns of vantage" be garlanded with evergreens. Now, if we had a hall "worthy of the city"—say, like St. George's Hall, Liverpool—all this might be saved. As the lady in "The Spectator" could not put a patch upon her face without hiding a beauty, so then no decorator could either wreath a column or drape a window, without committing a sort of sacrilege. Yet there are those, I believe, who, despite the genius of an Elmes and the taste of a Cockerill, would be zealous to commit it; who, upon the first fitting opportunity—to celebrate the completing or the opening of the building—would choke the acanthus with evergreens, and smother the architecture in upholstery, the perfection of art being, of course, the concealing of it (*ars est celare artem*, free-and-easily translated), and then expect you to appreciatively thank as well as handsomely pay them for having so successfully done it. It had, doubtless, been left for them to make the hall really "worthy of the occasion;" proportion, symmetry, light and shade, and perspective, although seemingly insuperable, they would wholly overcome; decoration crowned with laurels they would see triumph over architecture; and the newspaper press, as in duty bound, would, with its ordinary intelligence, advertise the victory.

Whether or not a new hall may spare us some of this "wasteful and ridiculous excess," we are apparently to have it. Of "the good City Hall," as Dr. Anderson called it on the occasion of his jubilee, Glasgow seems to have become either tired or ashamed, and accordingly at noon on the sixth day of October there was a meeting held of gentlemen who are taking an interest in promoting new and adequate music and assembly rooms for the citizens. The acting chief magistrate presided, and he stated that a sub-committee had made preliminary inquiries in Liverpool, Manchester, and elsewhere, and had procured plans of buildings of a superior description, which were exhibited; and that a site had been offered on the west side of North-street, between Berkeley-street and Kent-road, and bounded on the west by Rochester-street, and which, being in the very centre of the "West-end," was in a most eligible position for the projected buildings. This ground, containing 9,910 square yards, can be had for £30,000, and the total cost of the undertaking is estimated at £121,402. The capital is assumed at £125,000, in 12,500 shares of £10 each. The concert-hall is intended to seat from 2,500 to 3,000 persons, and to have an orchestra for 600 performers; and the assembly-rooms are to have accommodation for 250 couples on the occasion of a ball, and for 500 ladies and gentlemen on the occasion of a banquet. It is proposed that the subscribers, in addition to interest on their shares, should have a preferential choice of seats at all public concerts and other entertainments. It is for the local press to discuss whether the site under consideration is not just rather much "in the very centre of the West-end;" so much so that the building would be a great deal more conveniently situated for the burghs of Partick and Hillhead than for a very large portion of the burgh of Glasgow; and it is for the Glasgow Institute of Architects to ponder, if it chooses, upon what is meant by the sub-committee having "procured plans of buildings of a superior description."

The following figures, taken from an official computation newly completed, shows the proportion, according to rental, of dwellings within the Glasgow municipal boundaries, including the old royalty:—

Houses at £5, and under.....	35,054
Above £5, and not more than £10	39,116
Above £10	19,822

Total..... 93,992

Out of these 93,992 dwelling-houses not more than 6,204 are upwards of £20 rental per annum.

Preparations are being made for the commencement of the building of the fountain commemorative of the introduction of water to Glasgow from Loch Ketturin. The fountain is to be terminated by a bronze figure, somewhat larger than life, of the Lady of the Lake. The sculptor is Mr. Mossman.

TOWN PAVEMENTS.

MR. E. CHADWICK, C.B., read a paper on Saturday, at Leeds, before the National Association for the Promotion of Social Science, on the sanitary influences of town pavements. He showed that the public health is very materially influenced by the good or the defective manner in which streets are paved. Amongst the evils arising from bad pavement, he cited the escape of gases, the baneful effects of vibration on the system, caused by unevenness; the loosening of the joints of pipes, and the affording of direct means for the propagation of disease. In places where self-cleansing house-drains and sewers had been brought into good action and where the death-rates had been reduced, but where some amount of typhoid and foul-air diseases yet lurk, they had been very much confined to those streets where the surface was unpaved and badly cleansed, and the subsoil soddened with foul matter. He spoke highly in favour of the introduction of the Val de Travers pavement, and stated that it had realised more than was expected in the amendment of town pavements. It was to be wished however, that the material were more abundant, that it might be obtained cheaper. It was to be maintained as a duty of the local authorities to provide such paving and cleanly surface conditions in the poorer districts that there would be no mud for the children to roll in or to make mud pies of if they would. It was for the local authorities, and in their default—the default commonly of low landlords—it was for the central authority so far as to make the population as clean as might be done by cleanly surrounding pavement. Of course a special economy was to be consulted for such work, and was available for those districts where there was little quick traffic, and where the same peculiarly hard road surface was therefore not needed. Justice, he contended, was not done to the Val de Travers pavement by carrying it out in isolated patches. With the new available materials, the professors of sanitary science might put these questions to urban populations:—Will you obey the command, "Wash and be clean?" Will you pave so as to enable us to do so? Will you pay for good paving and cleansing, to save the direct expense of filth in clothes and extra cost of washing? Will you pay for good paving, to save more than half the expense of horses and carriages and the cost of transit? Will you pay, in good paving and cleansing, to reduce the greater expense of the filth diseases? The time, he predicted, would come when a local administration would be tested, especially in the lower districts, by the smell of the place and by the look of the people inhabiting it.

ARCHÆOLOGICAL.

EXCAVATIONS IN ROME.—We learn that the Italian Government has constituted Signor Rosa chief superintendent of excavations and antiquities for the province of Rome, with almost unlimited power over the whole region; in one direction from the Capitoline Hill to the Porta San Sebastiano; in the other, from the Baths of Titus to Monte Testaccio; the operations to be commenced at once, with 300,000*l.*, to be continued annually. An extensive series of excavations has been begun within the long-neglected Forum, and in the Baths of Caracalla.

CARNAC AND STONEHENGE.—The *Illustrated London News* has lately been giving a series of engravings depicting some of the Druidic remains of Brittany. There is evidently a great difference (says our contemporary) between the mere parallel shapeless fragments at Carnac and the concentric circles and uniform tri-lithic structure at Stonehenge, with the marks of human workmanship in its squared and neatly-adjusted slabs. It does not follow because the latter are certainly artificial that every stone-range or stone-pile which may have been associated with Druidic worship, or with some more ancient superstition, was put together by the hand of man. As Mr. Thomas Wright observes, in his treatise on "The Celt, the Roman, and the Saxon," with reference to this subject in general, "Geologists and antiquaries seem now agreed that the rocking stones are not works of art, but that they are the result of natural causes, and that they have been classed erroneously among Druidic remains." The form of structure named a cromlech, or kist-vaen, which is much the same as what is called a dolmen in Brittany, consists of four stones, arranged so as to build

a chamber open at one side, but closed at the top. These seem to have been constructed for sepulchres, and it is probable that they were covered with heaped-up earth, to make a high mound or barrow. Galleries connecting one such chamber with another, like subterranean catacombs, may have been made under the artificially-raised bank of earth. The roofed chamber of stones, in fact, would be a contrivance to preserve the hallowed corpse, with any other sacred objects laid beside it, from being crushed beneath the earth of the mound above; and there may have been a covered passage for the priests to get access to the interior recess.

WESTBURY-ON-TRYM.—Mr. John Taylor, a resident, writes, expressing his surprise at the apathy with which even the educated portion of the inhabitants of Westbury-on-Trym appear to regard the threatened destruction of the ancient ivy-draped tower attached to the mansion known as Westbury College. This battlemented structure, it appears, is the only relic (except the collegiate church) of a Benedictine monastery that had its origin as early as the beginning of the ninth century, and was re-founded in A.D. 983, by Oswald, Bishop of Worcester, nephew to the famous Odo, Archbishop of Canterbury. Oswald frequently resided here with the monks, and Wulstan, his successor in the see of Worcester (whose fervent denunciation of the traffic in Irish slaves, for which merchandise in the bodies and souls of men and women Bristol was, in his day—A.D. 1093—a famous mart, were crowned with success) was also much at Westbury, and restored the conventual buildings there. The castellated tower, for whose preservation Mr. Taylor appeals, is a remnant of the work of the munificent William Canynge, the builder of Redcliffe Church; and as he was primarily buried at Westbury, and no memorial of him there exists, it would be no ill compliment to his memory if this venerable tower were retained as his monument. "I understand," Mr. Taylor writes, "that the property within which it is situated has recently been purchased for a building site, and that it is purposed to shortly take the tower down, and utilise the material in the erection of small dwelling-houses. Could it not be purchased from the present owner by some of the influential and wealthy inhabitants of the district, and be maintained uninjured by insulation in a grass plot or garden provided around it?"

A NEW DOMESDAY BOOK.—This is the subject of an able letter in the *Times*, on the shortcomings of the Ordnance Survey Office, and wherein it is maintained that by shaming the Government into quickening the operations "we may very soon, by the help of the parochial rate-books, secure for the England of the present day a Domesday Book as superior to that of the Norman conqueror as the country is in wealth, population, and all the elements of civilisation to the England of the eleventh century."

STAMFORD.—An interesting archaeological discovery has recently been made on some premises in High-street, Stamford. On removing the paper and canvas which covered the walls of the room adjoining the street, the greater part of a Mediaeval fireplace was brought to view: it was of Stamford stone of a fine grain, was seven feet in length, was worked at the sides with the double ogee moulding, and had evidently been ornamented with spandrels. The wall above, too, exhibited flowers and foliage in fresco painting or stencilling; but, owing to the activity of the workmen, this relic of a past age soon disappeared. The other walls were found to have been originally built of oak and plaster, and were apparently those of the principal room of a house erected in the early part of the sixteenth century. Beneath is a cellar of ashlar stone, with a semicircular arched ceiling, and of excellent masonry, of a date contemporaneous with the wood and plaster structure above. Stamford is rich in these old cers.

THE SWIMMING BATH PART OF ELEMENTARY EDUCATION.—Mr. J. MacGregor, at the meeting of the London School Board on Wednesday, proposed that a Committee of the Board be appointed to inquire as to the present bathing accommodation in the school districts, and to report thereon, so as to allow due time for the provision of cheap and convenient swimming baths for the next bathing season. The proposal was referred to the General Purposes Committee. We should be very glad to see the School Board actively moving in this matter. In a week or two the two largest and best known swimming baths in London will be closed for the winter, and those who value the exercise will be compelled to forego it until they re-open in the spring, or resort, at considerable inconvenience, to other baths, in out-of-the-way parts of the metropolis.

Building Intelligence.

CHURCHES AND CHAPELS.

AYLESTONE, NEAR LEICESTER.—A new Nonconformist chapel has been opened in this village. It is in the Early Gothic style of architecture, the materials for the walling being Clarkson's patent pressed red bricks, with dressings of Derbyshire stone. It will seat 200 persons, and has cost £500. The architect was Mr. Tait, of Leicester, and the builders Messrs. Glover, of Blaby.

BIRMINGHAM.—S. Philip's Church, Birmingham, which has been closed for five weeks, in order that it might be redecorated, was reopened on Sunday. The decorations have been designed by Mr. Yeoville Thomason, and executed by Mrs. Newbold, of New Meeting-street. In the nave the principal colour used for the piers is a warm buff or salmon colour, the reeds in the flutes being picked out darker. The plinths and hollows to the base are in Indian red, and the capitals in red and blue.

EDINBURGH.—The New Trinity College Church is about to be commenced. The designs are by Mr. Lessels, and provide for the reproduction of a considerable portion of the old church. The building will be of an oblong shape, with a tower and broached spire rising to the height of 115ft. The height of the roof-ridge is 65ft. The part of the old church selected for preservation is the east end; but, instead of its being placed end-on to the new structure, it is to be turned round so that the apse will come in as part of the east elevation of the composite edifice, while a gable, reproducing the old transept window, will form a corresponding feature in the west elevation. The clerestory will be reproduced exactly as it appeared in the old building, as will also the beautiful roof of groined stonework. The original width of the nave, 24ft., and its original height of 48ft., to the spring of the arch, will be preserved; while the length of the reconstructed portion will be 65ft., nearly corresponding to the width of the new church.

KIRKBY.—The new church of S. Chad, Kirkby, Cheshire, was consecrated on Wednesday week. The structure, which is in the Early English style, was erected according to plans furnished by Messrs. Paley and Austin, of Lancaster. Mr. E. Gabbett, of Moira-street, Liverpool, was the sole contractor, portions of the work being sublet. The entire cost, amounting to about £12,000, has been sustained by the Earl of Sefton. The church is cruciform, of the inside length of 135ft.; breadth, 55ft.; height from floor to ridge of roof, 63ft. It is divided into a nave 91ft. long, with aisles of corresponding length, and 11ft. 3in. broad. The nave is divided from the chancel by a central tower and transepts. The church will accommodate about 560 persons.

MEARS.—The old church of S. Mary, Mears, near Glastonbury, is being restored. The three galleries have been removed, the floor of the church relaid with blue lias stone-paving, the whole of the stonework and bases of columns restored, the body of the church reseated, the chancel raised five steps, new reredos in Bath stone, with plaques of Maw's encaustic tiles: stone credence table, altar-rail, and standards; oak choir-stalls (made out of some of the oak seats); and the old stone pulpit restored. The chancel, tower, and nave were built about 1322, and the aisles by Abbot de Selwood 1457, whose monogram still exists on the east side of the parapet of the south aisle. Whilst the works were in progress, the piscina on the south side of the altar, and the hagioscope through the north pier of the chancel arch, were revealed. This arch is peculiar, having only one pier on the north side, being flush with the wall on the other. The architect is Mr. E. Baddeley, of London.

RAMSGATE.—A new statue of S. Augustine of England, the work of Mr. Boulton, of Cheltenham, has been placed over the entrance to the Benedictine Church at Ramsgate. The corbels and capitals of the pillars have also been carved by the same artist, as well as the shields on each side of the statue, thus completing the original design.

BUILDINGS.

BOWLING.—St. John's Schools, Bowling, Yorkshire, were opened last week. The style of the building is Gothic. It has been erected at a cost of £2,000, from the designs of Messrs. T. H. and F. Healey, architects, of Bradford.

GATEHOUSE.—A new clock tower has been inaugurated at Gatehouse-of-Fleet, N.B. The tower is 9ft. square, and rises to a height of 55ft. from the ground. The design is from plans furnished by Mr. Pilkington, Edinburgh; the contractor for the work was the late Mr. Cairns, builder, Gatehouse, and the

cost of the erection was £267. The tower is square in form, and is divided into three stages—the lower portion being battered to the height of 17ft., the middle storey pierced on four sides with long, narrow, round-headed windows, and the masonry of both are of whinstone with granite facings. The upper story is built entirely of Craignair granite, and on each face of it are arched recesses for the reception of the clock. The structure is surmounted by a corbelled parapet, built of granite.

HULL.—New offices for the Hull Dock Company were opened on Thursday week. The building stands upon a triangular plot of ground, facing Junction-street, New Cross-street, and the Queen's Dock respectively. The style is Italian, the three façades being similar in character, coupled pilasters of the Ionic order, having enriched bands, with a regular entablature and balustrades over, being used for the ground floor, over which is a highly-enriched entablature corresponding with the height of both orders, and with a blocking course of cornetted terminals above. Semi-circular headed windows are arranged in each story between the pilasters, with appropriate dressings, and in the space between these and the first floor and the main entablature are sunk panels with beautiful carvings of figures in relief. The ends of each façade are accentuated by wings formed by a recessed arch, with a channelled archivolt and carved keystone, and spandrels springing from imposts capping richly-banded piers of the height of the plinth of basement to the springing line of the heads of the first floor windows, a window of smaller size, but in different details, being arranged within the arch of the first floor, and that from the ground floor being treated the same as the general range, but with single columns flanking it instead of double pilasters. The architect is Mr. C. J. Wray, F.R.I.B.A., of 46, Cannon-street, London. The erection of the building generally, including the brickwork, masonry, carpenters' and joiners' work, painting, &c., has been carried out by the Dock Company's own staff of workmen, under the superintendence of their resident engineer, Mr. R. A. Marillier. The whole of the structure is fireproof, on Dennett's system.

MAIDSTONE.—The ceremony of opening the new Grammar School at Maidstone was performed on Tuesday afternoon. The style adopted in these buildings is late Gothic. The principal school-room will be 50ft. by 25ft., and will seat comfortably at the desks 108 scholars, but in reality has floor space for 150. Adjoining the school-room, and approached by the corridor, is a class-room, 19ft. by 15ft., which will accommodate a class of 34 scholars; and in addition to this there is another class-room, 30ft. by 20ft., which affords floor space for a further number of 75 boys. The whole of the scholastic portion of the building is cut off from the master's residence. There is to be a bath-room on each floor, with lavatories and clothes store, &c.

THE MADONNAS OF DARMSTADT AND DRESDEN.—Mr. J. A. Crowe contributes to the last number of *Im Neuen Reich* an article of great value on the Holbein exhibition now open at Dresden. Its chief point, according to the *Academy*, lies in an elaborate and convincing technical comparison between the great rival "Madonnas" of Darmstadt and Dresden, which seems finally to establish the certainty that the former is the genuine original and the latter a copy—an opinion entertained by Mr. Wornum, and after vigorous opposition accepted by Dr. Woltmann and some other critics in Germany. Mr. Crowe does not think that the copy can be with confidence ascribed to any individual hand, but sees in it the manner generally characteristic of the Netherland students of Italian art at the end of the sixteenth century. In the course of his remarks Mr. Crowe appears to accept as undoubtedly genuine the male portrait lately acquired by Mr. Millais. The question of Holbein's birth-year, and the question of authorship as regards the Augsburg "S. Anna," are both reopened since the experiment by which H. H. H. Sesar, and Huber (see *Academy*, vol. ii. p. 372) have finally proved the spuriousness of the inscription setting forth that picture as the work of the younger Hans Holbein in his seventeenth year. Mr. Crowe contends for the elder Hans Holbein as its painter, arguing from the great variety of style shown at various periods of that artist's activity. On the other hand, the new number of the *Jahrbuch der Kunstwissenschaft* contains an argument by Dr. Hison behalf of Sigismund Holbein in this connection, accompanied with an account of the experiment to which we have alluded, and with some elaborate genealogical researches into the family of Holbein, for which facilities have been given by the accession of a new keeper of the archives, Herr Christian Meyer, at Augsburg.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

RECEIVED.—G. J. H. & Co.—W. H. C.—S. W.—J. T. R.—J. W.—T. C., jun.—C. L.—W. B. & Co.—J. H. W.—S. O. B.—Art Student.—E. W. S.

WILL.—We cannot recommend books.

A SUBSCRIBER.—We know nothing of your former letter, but if it were not more polite than your second it deserved no notice.

A NORTH COUNTRY ARCHITECT.—See Patent Selenitic Mortar Company, on our front page.

STUDENT.—See our first article last week.

INQUIRER.—Yes, it would be asking too much. The illustration accompanying your query would cost at least two guineas to engrave, when probably it would not be worth 2s. or 2d. to any one else.

A. J. S.—The drawing being, as you say, twelve inches square, is not the right size. It is big enough, but not proportionate; twelve inches by eight would be about the thing.

Correspondence.

THE ABBEY CHURCH OF ST. ALBAN, AT ST. ALBAN'S.

To the Editor of the BUILDING NEWS.

SIR.—It would be difficult for any notices of the grand and venerable Abbey Church of St. Alban, at St. Alban's, to appear at the present time in your columns, which I should not read with a deep interest; and, accordingly, I beg to thank you for your opening article, and also for the brief communication signed by Mr. W. H. Lockwood, both of them in your issue of September the 22nd. While, however, I cordially agree with Mr. Lockwood, as well in his advice to all lovers of art and archaeology to visit the Abbey Church during the progress of the works that now are being carried on, as in both his admiration for the "ambulatory or ante-chapel to the Lady Chapel," and his lament over its deplorable condition, I am not able to concur with that gentleman in his statement that "the most attractive portions of the structure (of the Abbey Church), containing some good examples of the best periods of architecture, are the most ruinous and neglected, while much that is of later date and inferior is carefully watched and tended." Amongst those parts of the Abbey Church which are in the best condition of preservation are the Early English and the Decorated arcades of the nave, both the pier-arches and those of the triforium (the sculptured capitals of the latter executed with equal care and delicacy all round) works second to none of their order and period; the clerestory windows, it is true, are not in a condition quite so satisfactory. Now that measures have been adopted for averting the grave peril threatened by the tower to those parts of the building which adjoin and radiate from the central intersection of the cruciform plan, it is not possible to regard as ruinous or neglected the truly remarkable and very early Norman arcades—if they are Norman, and not the work of Saxons used by the first abbot after the Conquest—of the triforium of the transept; the choir also, and the retro-choir or presbytery in which stood the shrine of the British protomartyr, with their fine clerestory windows, and curious wooden vaulting, also with the unrivalled Wallingford, or altar-screen, which divides them, is even superior to its sister-screens in Winchester Cathedral, and the churches at Christchurch, Hampshire, and of St. Mary Overy, or St. Saviour's, in Southwark; and with the group of three noble arches—now closed with masonry, which opened the way on still further eastwards towards the Lady Chapel. All these, and the eastern portions of the aisles of the nave, and their vaulting and rich vaulting bosses that may be grouped with them, are, at any rate, in very fair preservation.

Of the monuments, the chantry of John de Wheathamstede, a work of extreme dignity and beauty, with the sole exception of the actual monument of the famous abbot, is a marvel of almost absolutely perfect preservation, the traceries, mouldings, and splendid heraldic sculpture being fresh and sharp as on the day when they left the artist's hands. The Ramryge chantry, which fills the opposite bay on the north side of the choir, a later and much more elaborate structure, notwithstanding much mu-

tilation, retains a large portion of its original beauties—and beauties they are of a very high rank. I must add that some of the massive timber for shoring up the parts of the building adjoining the tower appeared to me, when I visited the Abbey Church a few weeks ago, to have been placed in this beautiful chantry with a minimum degree of care and thoughtfulness. The third great chantry, that of Ilumphrey, Duke of Gloucester, on the south of the presbytery, which has suffered so much throughout the lower parts of its north side, has its canopy of clustered pinnacles almost uninjured; which also is the case from the basement upwards on the south side, where the original strong wrought-iron grille still fills the space between the main piers of the arch; even the statuettes remain unhurt in the many niches of this southern face of the canopy-work.

The three entrance doorways to the church from the west, with all the western parts of the nave aisles, must be specially mentioned amongst those parts of the edifice that have undergone the most wrong, next to the ante-chapel to the Lady Chapel—which, I may observe, closely resembles the corresponding part of Winchester Cathedral. The north-west and south-west entrance doorways may unhesitatingly be said, without exception, to have been the noblest and finest works of their class that adorned the palmy days of the Early English age of Gothic architecture. Now in a truly frightful state of ruinous decay, they still speak plainly and eloquently of their original grandeur, and no less plainly and eloquently do they demand to be—not restored—but reverently preserved, that they may continue to speak on of their great past to the time to come. At the present time surmounted by an enormous many-light window of the very worst pierced Perpendicular panel-work, the central entrance, still in use, was also singularly noble in both design and execution. The modern pavement of the nave, with its long array of early slabs always despoiled of their brasses and often broken, is raised considerably above its original level, and consequently, it has cut off and buried out of sight the bases of the lower ranges of clustered shafts of the double central doorway; and in like manner it has dealt with the bases of the aisle wall-arcades, together with the lowermost members of the bases of the piers in the main arcades of the nave. Some 25 years ago, with the sanction of the then excellent rector of St. Alban's, the late Dr. Nicholson, I myself dug out some of the earth at the central west doorway of the Abbey Church, and at the west end of the south aisle, to see if the bases still existed, hidden only, and not destroyed; and an arrangement was made at that time by which these bases are still shown to remain in a comparatively perfect condition, *in situ*. Except so far as they have left their mark upon the outer face of the south aisle-walls, the great cloisters have disappeared altogether, and the rich Decorated doorway which led to them is closed up. Close to the site of the eastern walk of the destroyed cloister, at the south end of the transept, there remains, massive still, but with too evident time-stains upon it, the vaulted and elaborately-enriched late Norman passage which led to the lodgings of the abbot. In the windows of the north aisle of the nave, which may justly claim the admiring study of all lovers of noble architecture, are a series of heraldic shields in stained glass, all of them of peculiar interest. Of the period of Abbot Wheathamstede (about A.D. 1450), they include several royal shields, with shields of more than one abbot; and there are also in this glass several beautiful figures of angels acting as supporters to the shields, after the manner of the sculpture by the same abbot on the altar-screen and elsewhere, together with his badges, the "Agnus Dei" and the eagle "agnus et ales," these symbols of the two Saints John, the Baptist and the Evangelist, having been assumed by the great Abbot to indicate his own Christian name. Some of this fine glass is fixed *in situ* in the window-tracery, where it is tolerably secure; but the royal shields are set amidst the common glazing of the window-lights, and to say that their position there is hazardous is to use a very moderate form of expression.

I do not propose to follow the author of the article with which your Number for Sept. 22 commences, through the wide and somewhat discursive range over which, in his zeal for the Abbey Church of St. Alban in the olden time, it was his pleasure to roam; but I may briefly express my surprise that, after speaking of the "spires" of the spire-less "Westminster Abbey, and Ely and Gloucester Cathedrals," in contrast with the "modest tower"—it is both massive and lofty—at St. Alban's, this writer should represent the "brass image" of Abbot Ramryge (not "Ramrygge") to have been "too much of the pastry cook order to endure," whereas the incised Purbeck marble slab to this abbot, much worn but not broken, is

lying in the pavement near the east end of the south choir-aisle. Again, it is strange to read that there is "no ogee" in this church, while the great pointed-arched window above the western porch, like the corresponding window at the north and south ends of the transept, are the flattest of ogee arches. Once more, this same writer adds that there are "no ball-flowers;" and yet the arches and mullions of the windows and their tracery-bars in the Lady Chapel (which has ceased to be degraded into a grammar-school, and is very far from being "simply a ruin"), are covered with some of the boldest and most effective ball-flower work that ever was wrought in stone in the days of the second and third Edwards; and, in like manner, instead of it being "impossible to separate the mighty Abbey church into distinct (architectural) sections," since the entire edifice with all its details "tells of one predominating style"—it would be difficult, indeed, as difficult as to find "zig-zag, spiral, and other mouldings" connected with the early "Norman cylindrical and rectangular piers" at St. Alban's, or to discover there any early Norman "cylindrical piers" whatever—thus difficult would it be to point to any great Mediaeval edifice, in which a "predominating style" is more conspicuous from its absence than in the Abbey Church of St. Alban, or in which the "distinct architectural sections" are more emphatically pronounced, and distinguished each one by its own special characteristics. In fact, it is from these very qualities that this great church—architecturally considered—is so specially important and valuable as a brick-and-stone-written dictionary of English architecture. What this writer may have designed to indicate as claiming special notice in the Abbey Church, by a "noble Baehie mask chaplet with ivy leaves," or by the "exquisite diamond-work" which has "almost disappeared" from "the third range of arches," and by several other, to me, no less mysterious passages, I shall not attempt to investigate. Still, amidst much in his article that is worse than perplexing, he is intelligible enough when he exclaims:—"Talk of restoration! We may prevent the lovely abbey from falling into a mass of decay; but we can never revive its glory. What must it have been when the mighty beam supporting the roof-loft was one picture of superb carved work; when the two celebrated bells christened Alban and Amphibal were hung on Holy Thursday in 1349; and when the Lady Chapel glowed from floor to dome with gold and glitter?" It is a suggestive longing, such as this, for a restoration which would renovate, and renovating would destroy, that has kept at so low an ebb the subscription for the proposed restoration of what has come down to us as the Abbey Church of St. Alban. It is not true, as many a noble act of munificence can testify, that either a niggardly spirit or an indifference to national monuments of the highest order is prevalent, or even in existence amongst us. The contrary is the truth. But the most devoted and the most open-handed lovers of venerable relics have learned to regard with the strongest suspicion any proposal for "restoration" in the case of such a relic as the Abbey Church at St. Alban's, even should the work be conducted by the most conservative of restorers. Accordingly I am persuaded that contributions to the "St. Alban's Abbey Restoration Fund" have come but slowly, not because the sum asked for in itself was too large, but because it appeared to be large enough to accomplish a vast amount of irreparable mischief. The very persons who would most gladly exert their utmost efforts to preserve St. Alban's Abbey Church would also most resolutely resist the hopeless destructiveness of any project for restoring it to the "gold and glitter" of its departed "glory." We do not want to exchange this old most true "lamp of architecture" for a new one, though the new one might be a reflection of what the original may be supposed once to have been. By all means let a new church be built, as exact a reproduction of the old Abbey Church in "its glory" as the builders can devise and erect; but let the old church continue to be the old church—the old church as it is now in its old days, and not as in its young days it once may have been. Thus, the "preservation" of the Abbey Church of St. Alban is one thing, as the "restoration" of it would be quite another thing. Let an appeal be made for funds to cleanse the grand old church from end to end from all defilement, to protect it from all wrong, to preserve it, as far as any work of man's hands may be preserved, from all further decay and from every threat of ruin, and let such an appeal be accompanied with a positive guarantee that, while everything will be preserved, nothing will be restored, and I feel assured that such an appeal will not be made in vain. It would, indeed, be truly sad to see ruin, positive and complete ruin, descending on the Abbey Church. Whatever such a ruin would retain, how-

ever, would be the veritable work of the men who long ago reared the fallen fabric; and such a ruin, though in broken language, would retain a truthful utterance. If, therefore, we really cannot keep in all honour whatever is precious in this time-honoured edifice, let us not dishonour it by restoration. Far better that it should come down than that it should be "done up." Rather than that the restorer, with ample means and unrestricted powers, should work his will upon the Abbey Church at St. Alban's, let it "share the fate of Kirkstall," of Fountains, and Netley, and Tintern, and their sister ruins. But I have no fears for St. Alban's, when once it is thoroughly understood that subscriptions are asked for an honest and faithful preservation, without the faintest suspicion of a desire to see this "pride of English churches" become at least as much a work of the nineteenth century as of any earlier century, and "glowing again from floor to dome with gold and glitter."

Ask, sir, for a "St. Alban's Abbey Church Preservation Fund," and whatever sum that fund may require you may be assured will not be withheld.—I am, &c.,

CHARLES BOTTLE,

One of the Founders, and of the first Hon. Sec.'s of the St. Alban's Architectural Society.

October 7, 1871.

A CITY IMPROVEMENT.

SIR,—I was much surprised at the statement made in the last number of the BUILDING NEWS, to the effect that it is again in contemplation to make an opening between Jewin-street and Smithfield, by way of that *cul-de-sac* Bartholomew-close. Surely the planners of such a scheme could not have contemplated the cost of the compensation to be paid for removal of premises, &c., of so many large and influential firms—the cost of which would be immense—to make a semi-circular street, and Jewin-street is already too narrow for its growing traffic. Would the proposer turn his eyes a little more south, and he could make wide a short opening, much more useful, and at many thousands less expense. Cutting Bartholomew-close at angles, a street from the south-east corner of the said Close, opening out between Falcon-street and Little Britain, would divide the traffic for the lower part—Wood-street, *viâ* Falcon-street; another portion would pass into Gresham-street; another would get into Cheapside; and the south-east traffic would take Cannon-street; and in this way the whole of the growing traffic eased off. The property between Bartholomew-close and Aldersgate, being occupied chiefly by yearly tenants, he would be able to make the cheapest and most useful street in London. If you add any more traffic to Jewin-street, the stoppages would be as frequent as they now are in Long-lane.—I am, &c.,

BARTLEMY.

VENTILATION OF S. THOMAS'S HOSPITAL.

SIR,—I beg to inform you that there is no truth whatever in the "rumour" which you published in your last number as to the failure of the system of ventilation at S. Thomas's Hospital. I shall feel obliged by your insertion of this in your next issue.—I am, &c.,

HENRY CURREY, Architect.

37, Norfolk-street, Strand, W.C., Oct. 10.

LINTELS FOR CONCRETE BUILDINGS.

SIR,—In building with concrete, are lintels required for windows and other openings, or is the concrete of sufficient tenacity to withstand the weight upon it in such cases as before mentioned? Also, what is the experience of any one as to the cheapness and durability of the Broomhall Tile Company's Patent Blocks for casing concrete?—I am, &c.,

ECONOMY.

DESIGN FOR COUNTRY RESIDENCE.

SIR,—I was pleased to see the criticism on the design lately published in your journal, considering it fairly and sensibly done, and likely to be useful to the author of the design, unless blinded by vanity, and to your readers generally, as the errors pointed out are of common occurrence. I had, independently, noted the defects, and I perfectly agree with the writer of the criticism. That he does not give his name does not, it appears to me, detract in the least from the value of his remarks. I think criticism, provided it be honest—and I expect, sir, you would see to that—is better for being anonymous. It is so much the rule in this country to suppress the names of writers that it seems something like pretentiousness and conceit putting one's name. To avoid

invidious remarks, I will, however, subscribe in full. I should like, sir, from my experience, as Mr. Watson is not convinced, to re-affirm some of "H.'s" statements. As regards the drawing-room, although in town we are obliged to put reception-rooms on the first floor, yet it is manifestly inconvenient, and, except from necessity, such should never be there. In a country or suburban house the drawing-room should be on the ground floor. This rule one would think, is plain enough. Doors to sitting-rooms should not be less than 18 inches from side wall. The ill effects of inattention to this rule I am constantly reminded of, as the wall-papers of my dining and drawing-rooms (though frequently renewed) are always defaced and unsightly from the servants' dresses rubbing against the wall. At length I have been obliged to attach pieces of brown holland to the walls for the protection of the surface. I see also a picture-frame hanging near the door, suffering from contact with people's heads. Independently of this serious annoyance, the doors in such position are decidedly awkward to visitors entering. In a decent house, a readily-come-at-able gentleman's water-closet (under disguise) on the ground floor is absolutely necessary, with the *sine qua non* of external light and air. The proposed plan of "ventilating over the ceiling of the scullery and passage," and which I beg to say is not common, would prove a positive failure. The darkness of the main thoroughfare is a very grave defect, and a common one. The idea of the author fancying that by "two glass doors and three fanlights" this passage would be sufficiently lighted! Glazed doors are an abomination, and but little benefit. All passages should have direct light, and plenty of it. We have too many dull days in this country to be satisfied with borrowed light. "H." I opine, in speaking of washing, referred to the cleansing of pots and pans, which Mr. Watson should know are always washed in the scullery, and the smell of which is objectionable, decidedly.

I am, &c., PHILIP E. MASEY.

SIR,—Let me reiterate a statement made in my former letter, that it is neither fair nor desirable to criticise a building from the illustrations, for obvious reasons; but when a gentleman like Mr. Thomas Lennox Watson takes upon himself the office of teacher in the profession, by publishing picture designs that will never be realised only upon paper, we are thereby led to conceive that those designs must somehow be superior to the general run of works of that class. Therefore, as such, they should be open to a free and full criticism, so that by comparison and analysis the readers may judge for themselves whether its standard of excellence does or does not justify the exceptional course taken by the BUILDING NEWS in publishing it.

Let me invite your readers to refer to Mr. Watson's illustration (BUILDING NEWS, September 22). That gentleman failed to perceive the drift of my remarks concerning the relative positions of staircase, dining-room, and kitchen, and blinded himself to the blunder which he had committed by cavilling at a sentence. It is scarcely necessary to point out the confusion that visitors would be thrown into by themselves and servants crossing and re-crossing the hall and staircase while the dining-room is being prepared. The arrangement of these important rooms is so radically wrong as to destroy all harmony of plan throughout. The dining-room should be so placed as to be entered from the hall, and communicated with by the servants, that they shall not be seen by the visitors, and the kitchen conveniently close, but entirely shut off from it. Such arrangements are of primary importance to humbler mortals than Mr. Watson, whose greatest forte is in mock turrets, big roofs, and gigantic towers.

Mr. Watson says, "It is not customary to plan the door so far from the corners as to admit a chair being inserted," because "in any case it would spoil the wall for any large piece of furniture." We have only to refer to Mr. Watson's dining-room for a refutation of this dogmatic utterance, for on entering it the side-board (the proper position of which is at the end of the room) would stand exactly in the way, and we admit with Mr. Watson that in his case it is "impossible to have the door anywhere else," and the same remark refers to all other rooms, because the design is so ill-conceived that "it is impossible to have the doors anywhere else."

We have so far failed to ascertain why the pantry should have so prominent a place, confounding the living rooms with the butler's arrangements, which are properly in another part of the house. Visitors on business also need not disturb domestic repose; they ought to enter a business room, without being shown through the building.

It is not my purpose to discuss the propriety of placing the water-closet in the centre of the building, ventilating it "over the ceiling of the scullery," and lighting it "through the cloak-room;" but with all deference to Mr. Watson's "common practice" of such an arrangement, we can only repress our amazement that that gentleman should place it before the reader of this journal as worthy of emulation.

In "that part of the country that boasts of your correspondent's presence," nothing is so disagreeable to the architect, or derogatory to his profession, as to

discover when the work is done that sundry small, but nevertheless, absolutely necessary rooms have been omitted in his calculations. Not so with Mr. Watson, for says he, "Oh! put them in another building." Hence when it is pointed out to him the want of such things as larder, washhouse, servants' water-closets, and many other things, he gently hints to his client the advisability of another agreement for more work, and more percentage on the cost. The teacher in the profession should produce plans perfect and complete.

The statement that "the roofs are greatly exaggerated in height" has been a great mystery to Mr. Watson, which is to be regretted, considering it is a piece of vulgar construction which we should scarcely have thought that gentleman capable of aping. In a building of this kind it would be infinitely more handsome externally, and convenient internally, to have carried the walls a little higher, retaining the position of the ridge. A far more imposing building would be obtained at the same cost. We are told that the library over the parlour is to have an open timber roof and a balcony running round over the windows, so that the light would be expected (by Mr. Watson) to travel upwards through the well hole 15 or 20 feet to the top. It puts one in contemplation of that dim religious light which it is said will be the chief characteristic of a certain "dark, gloomy, imperforate vault" which is threatened to be raised near the Strand.

We might comment upon the vulgar roof of the tower, which dwarfs the building into comparative insignificance; but it is unnecessary to criticise the appearance of a house the plan and arrangement of which is so radically wrong and ill-conceived that it has not the remotest chance of ever being realised; or if so, the more pity for the possessor.—I am, &c., H.

SIR,—Like "H." (page 293), I too am dissatisfied with Mr. Watson's plan for a country residence (No. 873), while I recognise in his design evidence of considerable architectural ability, and desire to criticise his performance in a friendly spirit, and to make one or two suggestions which, in my opinion, would, if carried out, render the building more convenient to its inhabitants. First, then, I should like to have the library on the ground floor, and, as he contemplates an extensive one, I would suggest that he should use his dining-room for that purpose, which I would lengthen by taking the staircase more to the right, thus giving a larger corner for the doorway, for, in spite of his assertion to the contrary, I hold with "H." that the doorway should always be kept away from the corner of a room a sufficient distance to place a chair, say 2ft. at least. This done, the necessity for his pantry would not exist, and I would absorb it in the parlour, which would then be a really magnificent room. These two rooms might be connected by folding or sliding doors, to be opened for receptions. The business room to remain the same as now. For the purpose of the dining-room, I would absorb the space now occupied by the cloak-room, the store-room, and housekeeper's room, the entrance to it to be from the hall as now, but with an additional entrance to passage for servants. The kitchen might remain as shown, but the scullery to be placed on the other side, the area of which, and butler's pantry to be used first for cloak-room, with entrances adjoining staircase, and butler's pantry between that and kitchen. These would be of a convenient size then; at present both the cloak-room and butler's pantry appear to me to be much too large for ordinary requirements. The servants' hall to remain as shown, with the exception of the circular tower, which is both useless and expensive, though it has lights in it which should indicate a staircase. The three windows of the hall should be much enlarged, or the room would be far from cheerful. Remove also the ugly and useless buttress on the outside, and which now appears to support the oriel above. As he contemplates addition to the building on the right of the kitchen, space for the displaced housekeeper's room, store-room, and scullery might be found there for them. The library on first floor might now be used for a best bedroom, and while I don't think an open timber roof desirable, I would suggest that the pitch be kept as shown, or at an angle not greater than 60 degrees.

These alterations of plan would involve little alteration of elevation, and would, I believe, considerably add to the comfort and convenience of the house, and if you will be good enough to print these observations, I shall be glad to hear what Mr. Watson may have to say about them; at the same time not forgetting the old proverb that "Every man thinks his own child the handsomest." The design is generally so good that I am induced to offer these suggestions towards perfecting the plan, and this must be my excuse for troubling you.—I am, &c., E. GRIMES.

ENGINEERING SCHOOLS IN ITALY.—The number of engineering schools (or, as they are termed, schools application for engineers) in Italy is three. During the scholastic year 1868-1869 the number of diplomas granted was 656, being 395 at Milan, 79 at Naples, and 182 at Turin. At the University of Padua there is also a course of engineering, but only two diplomas were granted during the above-mentioned years. The total number of students entered on the books of these schools during the scholastic year 1869-70 was 569, of whom 190 were registered at Turin, 135 at Naples, and 242 at Milan.

Intercommunication.

QUESTIONS.

[2329].—**Asphalting.**—Could any reader give me the price of asphalting, such as is laid in Cheapside and the City?—**ASPHALTUM NIGRUM.**

[2330].—**Breaking-Weight of Stone Lintels.**—Is there any reliable formula for obtaining the breaking-weight of various stones, when used as lintels?—**E. K.**

[2331].—**The Church of S. Michael Royal, London.**—Can any one inform me why the top front gilt pipes of the organ of S. Michael Royal are not there now four years? Are they sold to pay the expense of repairing the organ, or what has become of them, for the organ looks very strange without them?—**CIVIS.**

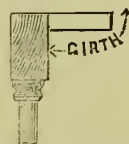
[2332].—**Geometrical Staircases.**—Will some draughtsman or practical joiner inform me the correct and mathematical way of making the ramp, and show the same method in a sketch (looking frontwards and sideways at it)?—**LOVER OF ART.**

[2333].—**Breaking-Weight of Lattice Girder.**—What would be the breaking-weight if placed on the centre of a lattice girder, 60ft. span, elliptical on top, 5ft. deep in the centre? The top and bottom flanges are formed of angle-iron, 4 $\frac{1}{2}$ in. \times 4 $\frac{1}{2}$ in. \times 2 $\frac{1}{2}$ in., riveted together, and the lattices of flat bar-iron, 2 $\frac{1}{2}$ in. \times 3in.—**T.**

[2334].—**Lithofracteur.**—Can any reader tell me anything about the new explosive, lithofracteur, or, as it is to be called, Kerb's explosive? Who are the agents in London, whether it is dearer than powder for blasting, and also if it is safe to send by rail?—**MINER.**

[2335].—**Civil Engineers.**—How can I become an Associate of the Institute of Civil Engineers?—**W. T. W.**

[2336].—**Measuring Artificers' Work.**—In a book on "Measuring Artificers' Work," it is said that the cradling to entablatures, &c., should be measured at per foot superficial. Would the girth be taken (as shown on sketch) and multiplied into the length of the entablature? A reply will oblige.—**TECTA.**



[2337].—**Architects' Charges.**—Will any reader kindly give his experience in the following? In the case of a client finding ironmongery, grates, and chimney-pieces, in the erection of a new house, is it the custom of the architect to charge the commission of 5 per cent. on the cost of each of the above-named? Is not such considered a part of the building?—**P.**

[2338].—**Asphalte for Roadways.**—I understand that the cost per square yard of paving a street with the Val de Travers asphalte is rather greater than that of paving with the best granite cubes or "setts." This is, of course, inclusive of the bed of concrete upon which the asphalte is laid; but can any reader say whether (in Paris or elsewhere) experience has shown that the same layer of concrete will serve as a bed for two, or three, or more successive layers of asphalte, presuming that the system of street-subways for gas and water-pipes, &c., is adopted (thus saving the concrete bed from being periodically broken up), and that the old and worn-out asphalte can be detached from the concrete on which it rests, without the latter being disturbed? If so, the cost of maintenance of our streets would, I apprehend, be greatly lessened. Also, I should like to know whether the Limmer and Barnett systems of asphalte-laying are similar to the Val de Travers in point of requiring a bed or foundation of concrete?—**DELTA.**

[2339].—**Diocesan Surveyorship.**—Can any one succinctly describe the duties?—**F.**

[2340].—**Notice.**—In the face of an ordinary monthly engagement, would it be requisite for the employé to give a clear month's notice of intention to terminate engagement, or would a notice served upon receipt of past month's salary (say a week or so overdue) suffice? If so, how should the notice be worded?—**SAM.**

[2341].—**System of Keeping Trade-Lists.**—Being an architect in practice, I receive every week a quantity of illustrated and other price-lists, all very useful for reference, and have now a box containing about 20ft. cube of them, closely packed. They, of course, necessarily differ from each other largely, in form and size. Some are goodly volumes, whilst others are on such flimsy single sheets of paper as to be very difficult to preserve intact. These papers lose half their use to me because I do not know what I have of them, and when I require to refer to them I have the least time to sort them over. Will some reader advise, not only myself but many others who are in the same "fix," what system of sorting and keeping such documents will render them easiest to refer to? I have tried the alphabetical system; but when I want say a particular range, of which I recollect most of the particulars, except the maker's name, I have lost all key to the whereabouts of the paper which illustrates it and gives its prices. I have at another time arranged the lists in the various trades, but a very considerable quantity could not be placed under the head of any of the usual building trades, and some include in one book matters

appertaining to three or four of those trades. Perhaps some system of indexing and numbering would be useful, but I am afraid would be almost too complicated to be kept up with sufficient regularity to be really useful.—**S. R. Q.**

REPLIES.

[2320].—**Is an Iron Porch a Fixture?**—The iron porch mentioned by "Architect" is a fixture by law, and cannot be removed by tenant.—**E. G.**

[2323].—**Paperhangers' Canvas.**—In the reply to the above in last week's issue there was a misprint. It should have been, "The canvas should be put on dry." The remainder of the paragraph correct.—**G. M.**

[2323].—**Paperhangers' Canvas.**—The advice given by "G. M.," as to paperhangers' canvas, is wrong, as may be easily shown. Hemp canvas shrinks when wetted, as most people know, and expands again on drying. If wetted, therefore, before stretching on stoothing, it will be baggy when dry. Stretch the dry canvas as tightly as possible, and nail to stoothing, paste your paper well, and hang as usual, and when dry it will be as tight and smooth as a drum-head.—**E. G.**

[2325].—**Pump for Dairy.**—The pump should be of tin for the barrel and suction-pipe, and of tinned-iron for spear, with customary wood "bucket."—**L.**

[2326].—**Principal and Interest.**—Here £1,462 represents principal and interest at 17 per cent., so does £117 represent principal and interest of £100 at 17 per cent. Hence £117 : £100 :: £1,462 : £1,249 11s. 5 $\frac{1}{2}$ d. nearly, and this latter sum, added to interest thereon at 17 per cent., £212 8s. 6 $\frac{1}{2}$ d. = £1,462.—**L.**

[2326].—**Principal and Interest.**—As 117 is to 1,462, so is 100 to the principal, equal £1,249 $\frac{67}{117}$.—**J. T.**

[2326].—**Principal and Interest.**—17 per cent. is $\frac{17}{100}$. Let x = the principal, then $\frac{x}{5} \cdot \frac{17}{100}$ = the interest. By the question $x + \frac{x}{5} \cdot \frac{17}{100} = £1,462$. Solving this equation, $x = £1,249$ 12s., and the interest = £212 8s.—**S. H.**

[2326].—**Principal and Interest.**—Let x = the principal; y = the amount of principal, plus the interest; z = the rate of interest per cent. Then—

$$x + \frac{zx}{100} = y.$$

Taking the example given by "£ s. d.," the above formula would resolve itself thus:—

$$x + \frac{17x}{100} = £1,162.$$

Multiplying by 100, to extinguish the fraction, we get— $100 + 17x = £116,200$; or $117x = £116,200$, and therefore— $\frac{£116,200}{117} = x$.

Consequently, $x = £1249$ 57 $\frac{1}{2}$ d., or £1,249 11s. 5d.—**JOS. OSWALD, Newcastle.**

[2327].—**Principal and Interest.**—Let T = principal and interest for one year; let $x = £100$; let $p = \frac{p}{100}$ per cent.; and P = the nett principal in pounds but for one year. Then will the following formula answer the purpose of "£ s. d.":—

$$\frac{T + 100}{x + p} = P.$$

$\frac{1,462 \times 100}{100 + 17} = \frac{146,200}{117} = £1,249$ 11s. 5d. $\frac{51}{117}$.—**S. J.**

[2326].—**Principal and Interest.**—"£ s. d." must have made a mistake in his figures. Discount is, by definition, the amount taken off a sum of money due some time hence (in consideration of its present payment), such that the sum paid, with the interest thereon during the time may amount to the original sum—i.e., the present value is the principal, which would produce the gross amount. The discount on £1,462 for one year (at 17 per cent.) is £212 8s. 6d. $\frac{53}{100}$, or a fraction over £212 8s. 6 $\frac{1}{2}$ d., which reduces £1,462 to £1,249 11s. 5 $\frac{1}{2}$ d., and not to £1,213 8s. 6 $\frac{1}{2}$ d., as stated by "£ s. d." Before occupying your valuable space, questioners would do well to verify their calculations.—**T. H. E.**

[2326].—**Principal and Interest.**—The formula for solving this question is obtained by a simple equation, and is as follows:—

$$\text{Principal} = \frac{g}{1 + r}.$$

g = gross amount of principal and interest: r rate per cent., which must be considered as the decimal part of 100. It will therefore have to be borne in mind that, for all rates under 10 per cent., the decimal will have to be preceded by a cypher, thus:—

Divisor for	1 per cent. is	100
"	1 $\frac{1}{2}$	1-0125
"	1 $\frac{1}{4}$	1-015
"	1 $\frac{1}{8}$	1-0175
"	2	1-02
"	10	1-1

Applying the above formula to the question given by "£ s. d.," we have—

$$\frac{1,462}{1-17} = 1249-573 = £1,249$$
 11s. 5d $\frac{1}{2}$ = principal,

$$\text{and } 212-427 = 212$$
 8 6 $\frac{1}{2}$ = interest.

$$£1,462$$
 0 0

Take another example. What has a contractor to pay

me for supplying quantities at $1\frac{1}{2}$ per cent., the gross amount of the tender being £40,700? Answer:—
 $\frac{40,700}{1.0175} = £40,000 = \text{nett amount of tender.}$

$700 = \text{commission @ } 1\frac{1}{2} \text{ per cent.}$
 $£40,700 \quad \text{—J. W. (Lincoln).}$

[2326.]—**Principal and Interest.**—There is no difficulty in solving the question, and the following formula is universally applicable:—Let A equal the total sum, which evidently consists of two parts (the principal and the interest). If either of these be found, the other is also then easily got by subtraction from the total sum. Let the principal = x , and the interest y , then by the question $x + y = A$. Put R, equal the rate of interest, and we have the proportion $x : y :: 100 : R$; from which we get—

$$y = \frac{R \times x}{100}$$

Substituting this value in the above equation, we have—

$$\left(x + \frac{R \times x}{100}\right) = A.$$

Reducing and solving for x , we obtain—

$$\frac{(100x + Rx)}{100} = A.$$

From which the general formula for x , that is, the principal, becomes—

$$x = \frac{100A}{100 + R}.$$

Now, let “£ s. d.” apply this to the question he gives, and we have—

$$x = \frac{146,200}{117} = £1,249 \text{ 11s. } 5\frac{1}{2}\text{d.},$$

which is the principal required.—CRUX.

[2326.]—**Principal and Interest.**—Principal, £1,249 11s. 6d.; interest, £212 8s. 6d. Total, £1,462.—F.

[2328.]—**Architects' Charges.**—Tenders having been obtained, all charges would naturally be based upon the amount of the lowest. In their absence the only existing basis of charge would be the approximate estimate. Surely a *bond fide* tender on quantities supplied must be nearer the actual value than an approximate estimate could be? In the event of the lowest tender being less than the approximate estimate, would the client in that case have “refused payment”?—F.

LEGAL INTELLIGENCE.

AN ARCHITECT'S BILL.—CARLISLE.—Hodgson v. Bowstead.—In this case, Mr. Ostell appeared for the plaintiff—Mr. Hodgson, architect, of Carlisle.—The action was brought to recover the sum of £10 8s., balance of account for architect's work.—In support of the claim, it was alleged Mr. Hodgson was engaged by defendant to superintend in his capacity as an architect the erection of a dwelling-house in Brunswick-street, Carlisle, and his remuneration was to be 5 per cent. on the net cost of the house. The cost of the house, as shown by the original contracts, was a trifle over £700, and Mr. Hodgson had been paid the percentage on the amount—£35. While the house was being erected, however, improvements and embellishments were introduced, and these increased the cost of the building to a little over £900. Mr. Hodgson's bill being thus increased to £45 8s., and it was for the difference between the latter sum and the £35 that had been paid that the action was brought to recover.—The defence was that the agreement with Mr. Hodgson was that he should be paid 5 per cent. on the original contract price for the building, and that the £35 settled all that was due to the architect, a specific agreement having been made between the parties to that effect.—His Honour thought that the use of the words net cost of the building inferred that plaintiff was to be paid a percentage on the entire cost.—Mr. D. Birket, architect, was called by Mr. Ostell, and stated that for such a house as the one in question five per cent. on the cost was a reasonable charge for the architect's work of superintending its erection. It was usual to charge percentage on the entire cost.—His Honour gave a verdict for the plaintiff for the amount claimed.

A CONTRACTOR IN THE BANKRUPTCY COURT.—RE H. A. HOLDEN.—This case was before the Court last week, by way of appeal from Mr. Registrar Keene. The bankrupt, Howard Ashton Holden, described as a contractor for public works, and carrying on business in Bishopsgate-street, had acted as contractor for the construction of the Albert Bridge. The contract was with the Albert Bridge Company, who agreed to pay the bankrupt £61,000 in fully paid-up shares and £20,000 in debentures, which, however, were only to be issued on a certain number of shares being subscribed for, or after a certain amount of work had been done. The bankrupt had assigned his contract, but under the original contract it appeared that he had incurred obligations for a considerable amount to Sir Thomas Parkyn, Captain Rogers, and others. Those gentlemen had voted in favour of resolutions for the acceptance of the composition of 2s. in the pound offered by Holden under his petition for liquidation, but the claims were rejected by Mr. Registrar Keene, mainly upon the grounds that the services agreed to be rendered by the parties had not actually been rendered, and that the shares in the company, which were to be applied in payment of such services, had not, in point of fact, been issued. Mr.

Cottrell, in support of the appeal, urged that the claimants ought not to be prejudiced by the assignment of the contract, and that they had a clear right of proof against the estate. After hearing Mr. Treherne on behalf of the petitioning creditors under the bankruptcy, Mr. Registrar Roche said that he made no imputation whatever upon the parties who had been associated with Mr. Holden in the contract for the Albert Bridge; but at the same time he thought that the claims ought not to be assessed to outweigh those of other creditors whose debts were free from any objection. It was quite open to creditors to agree to any arrangement proposed under the bankruptcy, pursuant to the 28th section of the Act, the same as under the petition for liquidation. The appeal would be dismissed.

OBITUARY.

SIR THOMAS DEANE.—From Dublin we are informed of the death of this eminent Irish architect, at the ripe age of seventy-nine. The late Sir Thomas Deane was the eldest son of the late Mr. Alexander Deane, an architect in the county of Cork, where he was born in the year 1792. His name is very widely known in Ireland, he having been extensively employed as an architect for the last forty or fifty years by private persons, by municipal authorities, and also by the Irish Government, in many if not most of the various improvements in the public buildings, &c. in the south of Ireland, and especially at Cork. Among the chief works with which the name of Sir Thomas Deane is associated are the old and new savings banks, the Bank of Ireland, and the commercial buildings and court-houses at Cork. He was also the architect of the City Gaol and the Anglesey Bridge in that city, and the greater part of the naval and ordnance depôts erected on Haulbowline Island, in the Cove of Cork, were from his designs. He was magistrate for the county of Cork, and twice served the office of High-Sheriff of Cork—namely, in 1839 and 1851. Sir Thomas Deane received the honour of knighthood at the hands of the Lord-Lieutenant of Ireland in 1830, in recognition of his public services and professional attainments.

DEATH OF A NOTABLE RAILWAY ENGINEER.—Mr. Thomas Barker, a self-taught mathematician and practical engineer, has just ended his days as a “poor brother” in the hospital of the Charterhouse. The solution of many of the most difficult problems in the earlier stages of railway surveying and construction was due to his genius. It was he who invented the celebrated method of laying down railway curves, and the *Durham Advertiser* says that he “laid out the Stockton and Darlington Railway—the first line in the kingdom.” He also laid out the atmospheric line from Dublin to Kingstown, and in the infancy of the railroad system he was largely engaged in many parts of the kingdom. The last line which he surveyed was that projected by Mr. George Hudson for connecting Lowestoft with London, and for making that town on the eastern coast a second Liverpool—a project which the ruin of the “railway king” extinguished. Mr. Barker was the author of several works on mathematics, both theoretical and practical. Of these the best known are the “Elements and Practice of Mensuration,” a “Treatise on Land and Engineering Surveying,” the “Principles and Practice of Statics and Dynamics,” a “Treatise on Subterranean Surveying,” the “Mechanical Companion,” and “An Original Method of Integration.”

DEATH OF MR. THOMAS PILGRIM.—We regret to announce the death of Mr. Thomas Pilgrim, engineer, aged seventy-one years, on the 6th instant, at his son's residence, Plumstead, Kent. For the last thirty-five years the deceased was intimately associated with Mr. Francis Pettit Smith, and the introduction of the screw propeller. It may be remembered by some that Mr. Pilgrim acted as chief engineer of the *Archimedes*, celebrated in the history of steam navigation as the first ship ever sent to sea propelled by the screw.

THE CONSERVATIVE LAND SOCIETY.—At the seventy-sixth quarterly meeting, held on Monday, at the Norfolk-street offices, the report presented gives the quarterly receipts as £39,843 14s., the yearly receipts as £136,014 4s. 5d., and the grand totals to Michaelmas amounted to £2,719,373 19s. 7d. The total withdrawals since the formation of the society in 1851 to Michaelmas amounted to £441,691 17s., and the number of the last (£50) share issued to the same date was No. 36,472. The reserve or surplus fund stands at £10,500. The report was unanimously adopted. The rate of interest remains at five per cent. per annum on shares, and four per cent. per annum on deposits.

WATER SUPPLY AND SANITARY MATTERS.

BIRMINGHAM.—At the meeting of the Birmingham Town Council on Tuesday week, a special committee appointed to report on the disposal of the sewage of the town presented their report. The sewage question has for some months formed the most prominent and urgent question before the Birmingham Corporation, an injunction in Chancery having been obtained to prevent the pollution of the local river. After the ordinary committee of the council had presented several reports which offered no generally satisfactory solution of the question, a special committee was appointed, which has gone into the matter in a thorough manner, and has received the assistance of the most eminent authorities on sewage. The report, which was most voluminous, after revealing the abominable results of the present system, concluded by recommending the gradual abolition of middens and substitution of a new privy system based upon the principle of exclusion from the sewers, and the weekly collection of all excrementitious matter, solid and liquid; a system to be developed in connection with the above of exclusion from the sewers and collection of refuse of slaughter-houses, cattle-markets, urinals, cow-houses, and stables; an experimental trial of the Rochdale and Manchester systems; and ultimately an extension to the whole town of that system which shall be found to be the most efficient for the exclusion of deleterious refuse from local works.

EAST LONDON WATERWORKS.—A dividend at the rate of 6 per cent. per annum, free of income tax, has been declared.

COVENTRY.—Last week there was a special meeting of the Coventry Local Board of Health, to discuss the sewage question. The Town Clerk was instructed, under the seal of the Board, to defend an action for fouling the river Sherbourne, brought by Mr. Herbert Jackson. The Board then received Mr. Hawkesley and Mr. Blackburn, the former presenting and explaining his plans for the construction of engines for the pumping of the sewage on the farm at Pinley; and the other offering explanations in reference to the mode of distributing the sewage upon the land. The full consideration of the matter is to take place at another meeting.

BLACKBURN.—**EXTENSIVE SEWAGE OPERATIONS.**—The most extensive scheme for the irrigation of towns' sewage yet promulgated and in actual progress of development is, perhaps, that which is now being carried into practice by the Corporation of Blackburn. During last session, this Corporation obtained powers to effect large purchases of lands, or to acquire them on lease; and powers were also secured to borrow between £200,000 and £300,000 to carry out irrigation works, with liberty to spread the repayment of loans required in purchasing lands over a long term of years. The Corporation have power to acquire 1,000 acres of land in Plesington, Houghton, and Samlesbury for irrigation purposes. An agreement has been entered into between Sir Henry de Houghton and the Corporation with reference to the Higher and Lower Park Farms, which consists of about 180 acres, and possession has been taken by the Corporation. Upon these farms it is proposed to utilise part of the sewage, which will be distributed by means of valves and troughs. The land, for the most part, has a wild, moor-like aspect, but the soil, being of a sandy nature, is well suited for receiving a large quantity of sewage.

UTILISATION OF IRON SLAG.—Numerous propositions have been made for the utilisation of iron slag. When the ore is smelted requires the employment of an aluminous flux, we have a slag which is capable of being worked up into alum; it is also admirably adapted to the preparation of cements. Where limestone is used as a flux, the slag is an impure glass capable of being employed in the construction of buildings, walls, and roads. Instead of allowing the cinder or slag to run away into rivulets, it would be possible to have it cast in iron moulds of any required size, and after gradual cooling, by which it is annealed, it could be piled up ready for transportation. We have seen in Germany the gardens near a blast furnace, and even farm lands, surrounded by walls laid up of rectangular blocks of slag, which were thus cast at the mouth of the furnace; and there was another application of these blocks, which we have never witnessed in this country—viz., as soon as the casting was made the mould was put upon an iron wheel-barrow and hastily wheeled to the kitchen by one of the workmen, where it was dumped upon the hearth, and served for heating the house and cooking the dinner. Each workman was entitled to a certain number of these blocks, and after they were cool they were either used in making a wall round his garden or in constructing a house. The rectangular iron moulds were placed in the track of the overflowing lava, and there appeared to be no practical difficulty in thus economising the heat of the cooling mass, and of subsequently employing the blocks as indicated above.

Our Office Table.

THE ARCHITECTURAL ASSOCIATION.—This Association commences its next session on Friday, the 27th inst., with a *conversazione*. An Architectural Exhibition will also be opened at the same time, and continue open daily from 10 a.m. till 10 p.m., until November 4, admission free. All drawings must be delivered at the office in Conduit-street on or before Monday, the 23rd inst.

WORKING MEN'S COLLEGE, 45, GREAT ORMOND STREET, W.C.—The Art Classes already formed comprise—Elementary, Pencil and Chalk, Water-colour, Ornament, Architectural Drawing, Antique, Still Life, and Life; the teachers being Mr. W. Cave Thomas, Mr. Henry W. Brewer, and Mr. G. Rosenthal. The lectures on Perspective will commence on the 20th.

PROPOSED WIDENING OF CHANCERY-LANE.—At the meeting of the Metropolitan Board of Works, on Friday last, the Works Committee presented a report recommending that a communication be addressed to the First Commissioner of her Majesty's Works, &c., representing to him the desirability of clauses being inserted in some bill to be introduced in the next session, to provide for the widening of Chancery-lane. After a great deal of discussion the report was referred back to the committee for reconsideration.

BURSELM SCHOOL OF ART.—The annual meeting of the Wedgwood Institute School of Science and Art was held at Burslem, on Thursday week. At present the benefits of the Institute are not sought for by students in such numbers as is desired, and as ought to be in a district where art study is so necessary for the development of its staple trade. The manufacturers, too, are apathetic. Though the Institute is free from debt, the expenditure for the past year exceeded the receipts by £13. Sir Smith Child delivered an address on the importance of art culture.

SQUARES WITHOUT RAILINGS.—In the *BUILDING NEWS* for July 28 last, p. 61, we treated of the London squares, and suggested (among other means of improving, enlivening, and rendering useful those desolate places) that the hideous iron railings encircling them should be removed. Our contemporary the *Graphic* takes much the same view. The project of a railway from Euston-square to Charing-cross (it remarks) appears to afford a hope that the unsightly nuisances in Leicester-square will be removed, and this locality, so familiar to our foreign visitors, rendered less disgraceful to our municipal authorities. The occasion, therefore, offers an opportunity of putting in a plea for a little more variety in the matter of our open spaces in town. It would be in the highest degree satisfactory if we could for once do without iron railings. This would of course necessitate a different sort of square from Lincoln's-Inn-Fields or Bloomsbury, for a garden with trees, grass, and gravel paths would hardly exist in London if quite open to the public. But surely we have squares enough of the Lincoln's-Inn-Fields type? Why should we not try the experiment of what the French call a "Place," and the Italians a "Piazza?" One such square was projected by a Duke of Bedford, who planned the space in Covent Garden where the market now stands, but the gardeners came and occupied it with fruits and flowers until they became too strong to be resisted, and now the very meaning of "piazza" is forgotten, and nothing is known by the name except the colonnade which half surrounds it. A real "place" or "piazza," such as is so common in Paris and Lyons, in Turin and Florence, would be an agreeable change, and would be welcome in the eyes of our foreign friends. In such a square a few beds of flowers like those which may be seen in the space opposite Palace yard would be appropriate, but the great point is to set the fashion of dispensing with ugly iron rails.

THE NEW LAW COURTS.—The *Observer* remarks that the first work of the New Law Courts has been very successful. The foundations were estimated to cost £35,000, but it now thought they will be made for £5,000 or £6,000 less. The contractors have come upon a valuable bed of sand, which will yield a sufficient supply for the whole of works.

FOOD ADULTERATION.—We are very pleased to note that the Liverpool Corporation are about to consider the advisability of appointing a public analyst to carry out, as far as such a miserable law can be carried out, the intentions of the Food and Drink Adulteration Act. This is the third town which during the present year is adopting this course, and we hail it as a slow though sure test of public opinion as to the necessity of more stringent legislation on the subject.

Chips.

The west window of Upton Parish Church, near Birkhead, has been filled with stained glass. The subject, the Crucifixion, was designed by Mr. John Cunningham, of Liverpool, the architect of the church, and executed by Messrs. Ballantine & Son, of Edinburgh.

A monument to Flora Macdonald, to be erected over her grave in Skye, is now all but completed, and may be seen at the granite works of Mr. Forsyth, Inverness. The monument consists of an Iona cross, 27ft. high, of which the principal stone is 18ft. in height, and upwards of 4ft. wide at the cross. The cross is a magnificent piece of granite. Nearly twelve months elapsed before a stone of sufficient dimensions could be secured at the Aberdeenshire quarries.

The reconstruction of the Vendome Column will commence next week, under the direction of M. Renard, the well-known contractor for public works. A Civil C.B. has been conferred upon Mr. J. H. Parker, who is now in Rome.

The Rev. E. L. Cutts, M.A., of Queen's College, Cambridge, and Billericay, Essex (well known to most of our readers as an archaeologist), has been appointed by the Dean and Canons of St. Paul's to the living of St. Andrew's, Haverstock-hill.

The Pope has been reproducing, by means of chromo-lithography, the mosaics of Rome, but the work has come to a standstill for want of funds. It seems, however, the process will be continued by Spithover, the German publisher.

Mr. Charles Noel Arnfield, architect, Whitby, has been appointed one of the two surveyors, under the New Ecclesiastical Dilapidations Acts, 1871, for the diocese of York.

It has been decided by the Town Council of Preston, Lancashire, at a recent meeting: "That the engineer should instruct Mr. Joseph Clayton to proceed with the work of the new covered market at once, according to the terms of his contract."

It is announced that new works will shortly be commenced in the Bay of Passages, near Irun, in order to provide the north coast of Spain with a harbour suited to its commercial resources.

The Secretary for War has consented to hand over to the Mayor of Portsmouth 13 acres of land, forming part of the glaciis opposite the railway station, and in the centre of the town, for the purposes of a "People's Park."

A provisional committee, of which the Mayor of Portsmouth (Mr. J. Baker) is the head, has been formed at Portsmouth, to set on foot a subscription for a public memorial to the late Charles Dickens in that town, the birthplace of the great novelist.

A special sub-committee of the Liverpool Corporation on Monday last recommended Mr. George F. Deacon, engineer, Liverpool, as borough and water engineer, the post left vacant by the death of the late Mr. Newlands. The recommendation has yet to be confirmed by the Council.

Mr. Joseph Clarke, diocesan architect, has been appointed under the new Ecclesiastical Dilapidations Act, in conjunction with Mr. Spooner, brother-in-law of the Archbishop, diocesan surveyor of Canterbury.

It has been decided to hold a Scandinavian Exhibition at Copenhagen, chiefly for the display of articles from Denmark, and Sweden, and Norway, but new inventions from other countries will be admitted.

The City Commissioners Sewers last week authorised the extension of asphalt paving in the City, at a cost of more than £6,000.

The River Clyde Trust have under consideration the erection of a 40-ton crane on the General Terminus Quay at the east end of the Mavisbank-bridge, Glasgow.

The Liverpool Town Council, at their meeting last week, decided upon assuming the proprietorship of the existing tramways in the town, which, it appears, they have the power to do under their local acts. It was also decided to obtain running powers over other lines which it might not be deemed desirable to purchase.

Baroness Burdett Coutts has been invited to lay the foundation-stone of the Working Men's Extension Wing of the Queen's Hospital at Birmingham. The ceremony is expected to take place about the end of this month. A sum of £5,000 has been raised in three years by the periodical contributions of 20,000 workmen in the principal factories of the town. This will be, it is believed, the first hospital in the kingdom erected by the contributions of working men.

Mr. W. H. Corfield, M.A., M.B., Professor of Public Health at the University College, has been appointed medical officer of health for Islington, in the room of Dr. Ballard, resigned. There were two other candidates—viz., Mr. Haviland, M.R.C.S.E., lecturer at St. Thomas's Hospital on "The Geography of Disease," and Mr. C. Moymott Tidy, M.B., Professor of Chemistry and Lecturer at the London Hospital. On the motion of the Sanitary Committee the special thanks of the Vestry were unanimously accorded to Dr. Ballard for the zeal and ability shown by him in the performance of the duties of his office.

Timber Trade Review.

PRICES, October 9.—Fancy wood per ton:—Bahama satin wood, £4 to £6; Rio rosewood, £15 to £25; Bahia rosewood, £13 to £18; Tulip wood, £9 to £18; Puerta Cabello Zebra wood, £6 to £7; Ceylon ebony, £9 to £12; City of St. Domingo lignum vitae, £5 to £10; Cuba Cocus wood, £5 to £6; Turkey boxwood, £4 to £14.

Baltic fir timber, per load of 50 cubic feet:—Riga, £3 5s. to £3 7s.; Dantz and Memel crown, £4 to £4 10s.; best middling, £3 5s. to £3 15s.; good middling and second, £3 to £3 5s.; common middling, £2 10s. to £2 14s.; undersized, £2 10s. to £2 15s.; small, short, and irregular, £2 to £2 10s.; Stettin, £2 10s. to £2 15s.; Swedish, £2 5s. to £2 13s.; ditto small, £2 to £2 3s.; Swedish and Norway balks, £1 12s. to £1 15s.

Baltic oak timber:—Memel crown, £5 10s. to £6 10s.; brack, £4 10s. to £5 5s.; Dantz and Stettin crown, £5 to £6; brack and unsquared, £3 15s. to £4 15s.

American timber per load:—Quebec red pine, £2 15s. to £3 5s.; large Quebec yellow pine, £4 5s. to £5 5s.; St. John's and board pine, £4 to £4 15s.; building sizes, £3 10s. to £3 15s.; Quebec oak, £4 to £5 5s.; Rock elm, £3 10s. to £3 15s.; ash, £3 10s. to £4 15s.; Quebec large birch, £3 15s. to £5; small averages, £2 10s. to £3 5s.

Deals, &c., per Petersburg standard hundred:—Quebec pine, first quality floated, £16 10s. to £18; second, £12 10s. to £13; third, £3 10s. to £9; ditto first quality bright, £18 to £19 10s.; second, £13 5s. to £13 10s.; third, £8 15s. to £9 5s.; Archangel best yellow, £12 10s. to £14 10s.; ditto second, £9 10s. to £10; Petersburg yellow, £13 to £13 10s.; Wyburg yellow, £9 15s. to £10 10s.; Gelfe and best Swedish deals, £10 10s. to £12 10s.; Canadian spruce, first quality, £9 10s. to £11; second, £8 10s. to £8 15s.; third, £7 15s. to £8 5s.; New Brunswick first quality spruce, £8 10s. to £9; second, £8 to £8 5s.; third, £7 10s. to £7 15s.

Trade News.

WAGES MOVEMENT.

BARNSELY.—The strike of bricklayers and labourers still continues, and there are no signs of a settlement. The masters express their determination not to give way, and are taking steps to supply the places of the men on strike. They state that they will find new hands constant work, and will protect them from all molestation. The men, on the other hand, are taking steps to prevent new hands being employed, and have pickets at the station and on the road leading into the town. The strike is causing considerable inconvenience, as nearly the whole of the work is standing.

ALNWICK.—The journeyman slaters of Alwrick have struck for an advance of wages, after giving their employers a week's notice to that effect. Heretofore they have been paid at the rate of 24s. per week, but they now demand 28s., a rise of 4s. per week. So far the masters have declined to accede, as they say they are unable to comply with the request of the men.

AGITATION IN THE NAIL TRADE.—The nailmakers of the Bromsgrove district, encouraged by the success which has attended the efforts of their brethren in the Dudley and Hales Owen district, are agitating for an increase of pay. A meeting of the Operative Nailmakers' Committee has been held, at which the state of the trade, and the fact that some of the masters are paying a farthing, and in some case a halfpenny, less than the net list settled in 1869, were taken into consideration, and it was resolved to take steps at once to obtain the payment in all cases of the full list price, with an increase of 10 per cent.

THREATENED MASONS' STRIKE.—The masons throughout the north of England are agitating for an advance of wages, and they intend shortly to put their demands before their employers. They receive at present from 27s. to 28s. per week, and they have resolved to ask for a uniform rate of 30s. They will give six months' notice.

LEEDS.—The operative plumbers of Leeds having asked for a reduction of their hours of labour to nine hours a day, and for an advance in their wages to the extent of 1d. per hour, a meeting of the Master Builders' Association was held on Friday last for the purpose of taking it into consideration. After a discussion it was agreed to call a general meeting of the master plumbers before deciding upon the question.

TENDERS.

BANBURY.—For building a house in Terraec-road for Mr. Richard Bailey. Plans supplied by Mr. Hackett:—
Davis Brothers £715
Kimberley 685
Claridge 668
Orchard Brothers 649

COCKLEY.—For new organ-chamber and fitting chancel at Cockley Church, for the Rev. H. Kempson. Mr. J. T. Meredith, architect. Quantities supplied:—

Horton £126
Smith 95

DURHAM.—For house, offices, stables, &c., at Seaton Carew, near West Hartlepool, for Robert S. Fawcett, Esq. Messrs. Alexander & Heuman, architects:—
Purden (accepted) £3326

HIGHBURY.—For the erection of workshop at Highbury, Coach Factory, for the London General Omnibus Company, under the superintendence of Mr. P. Tosh. Quantities supplied by A. J. Bolton:—

Dunford & Langham £1,475 0 0
Pettigrew & Moyes 1,420 0 0
Pink 1,292 0 0
Parsons Brothers 1,380 0 0
Cook 1,350 0 0
Randall & Cockle 1,310 0 0
Johnson & Co. 1,267 2 9

THE BUILDING NEWS.

LONDON, FRIDAY, OCT. 20, 1871.

THE AMERICAN CONFLAGRATIONS.

THE people of the United States are never timid, and rarely careful. They possess a territory so vast, so supremely superior in its immensity to all other countries of the world, Russia and China scarcely excepted, that it appears impossible, so to speak, to contain her energies within controllable limits. There is, moreover, in the national character which has grown out of this characteristic of the land, a daring and defiance leading often to calamity. Now Chicago, so young and yet so prosperous, was constructed with boldness, in splendour, on the grandest scale, with especially extensive waterworks, on the borders of a lake magnificent enough to be termed an inland sea; it had many streets and structures of stone, and still the conflagration overwhelmed everything in its way, the waterworks and the fire-engines among the first, the flames rushing to them along the plank pavements, the wooden railings, the mountains of lumber on the quays, the heaps of dry forest produce accumulated everywhere. There have been many assertions and contradictions upon this subject, but an examination of the best and most recent authorities will suffice to convince us that the United States' system of erecting new locations and converting villages into cities is a perilous one. The very thoroughfares are inflammable; and although it is perfectly true that the Americans, within the last twenty years, have adopted a substantial style, given up mere frame-work, resorted to their splendid and inexhaustible quarries, and built for posterity, as well as for the living generation, still it is equally impossible to deny that those multiplying towns of the West, swift in their rise and sudden in their wealth, represent, in a melancholy degree, a feeling of preference for riches over the security of human life, of ostentation over genuine solidity, of the old backwood principle of "clearing," "knocking-up," and "settling down," which was beneficent once, but which the people of the United States should surely now have outgrown, and which they really have outgrown in many of their next to illimitable territories.

Chicago is a city unique. While the great anti-slave war lasted it was almost the only city of the Union which enjoyed an unexampled prosperity. Its agriculturists, its manufacturers, its merchants and mechanics, were all flourishing with marvellous activity and success in every branch of industry and trade. Money and banking were in *exceelsis*; gold, the commercial thermometer, compensated for a thousand advances in price, and, strangest of any facts, insurance premiums ranged at zero. It may be interesting, however, to repeat, upon Chicago authority, an account published, somewhat boastfully, of that city, built "not for an age, but for all time," of the precautions taken to make it safe from fire, or to atone for its losses by this disaster. There were the Hertford, the Springfield, the Merchants', the Home, the City, the Relief, the Western, the Irving, the Connecticut, the Croton, the Thames, and the Mutual, all "solid and enduring, and fireproof,"—and all destroyed. It may be an additional and suggestive commentary that, with the whole of these offices annihilated, so far as the shells of the edifices accommodating them are concerned, the "water debt" of Chicago, at the moment of its ruin, amounted to not less than fifteen hundred millions of dollars. But what a commerce was that—in grain, in flour, in meal, in wheat, in corn, rye, barley, oats, beef, pork, hogs, and so forth—and upon what a perishable basis! It is useless to combat the fact that

the pork-packing brokerage warehouses of the Western capital were run up with an utter indifference to security. The aim was to get space and light; to do the work expeditiously; to "handle," "bulk," and cut up so many pigs a day; to employ machinery for the carving of carcasses, and to make fortunes with all the rapidity possible. So much for the materials of Chicago; now for its contents. It contained, a few months ago, not less than a thousand millions' worth (in dollars) of timber, in lumber, shingle, laths, squared wood, cedar posts, railroad ties, telegraph posts, and stove-bolts; and the winter was especially propitious for logging; while the demand for fencing, flooring, and clear or finishing lumber was peculiarly great, owing to the shortness of water in the rivers during the preceding season. Then there were prodigious stores of oil and of coal, the latter of the highly-combustible "egg and chesnut size." Well, a Chicago periodical, proud of all this plenty, says "it never rains but it pours,"—which, by the way, is not true. "For years the people of Chicago have been growing about their water supply, and growing more and more despondent over its increasing blackness." This was written six years ago; since then, it was determined to tunnel out under the lake. An abundance of water was made accessible to the city; it flowed, not from the lake only, but from the bed of the Rock River; and, simultaneously, works were commenced to complete a system of fire alarms and precaution. The Chicago description of this, in consideration of recent events, is peculiarly interesting. It is to the effect that "one of the most important enterprises in our capital of the West has been the adoption of the fire-alarm telegraph. There have been already about a hundred and twenty-five miles of wire laid down, forty-five in the south division, fifty in the west, and thirty in the north;" and yet not one of them proved available. "In addition, there are river cables connecting these three divisions of the city." We continue to quote the local organs, because they must throw the truest light upon so dreadful and inexplicable a catastrophe. "This work, when completed, will materially reduce the amounts now lost yearly by fire, furnishing the means of giving instantaneous and precise notice of a fire, and its location. There will be another, not small, advantage: the crowds now drawn to the scene of a fire by the sound of a court-house bell will be wanting; the alarm will be silent to all save those who are needed to assist." Here we have two facts demonstrated: that fires, so to speak, were familiar in the natural history of Chicago; and that its boasted system of protecting telegraphs has been an utter failure. But it would almost appear that the Americans take pride in their fires, as they do in their storms, vaunting even their thunder as superior to that of other regions. "A fine fall of snow for a young country" was an observation made once to Lord Metcalfe, then Canadian Governor-General. Let us glance at the losses, computed by dollars, of the Northern States alone, in one year only—it reached a total of twenty millions of dollars. But this sum includes no estimate of the destruction by fire caused in that year of horror, through the war, or the fearful ruin of timber at Long Island, in New Hampshire, in New York, Michigan, Maine, and in the Lake Superior country. It simply represents the amount of property consumed by the ordinary agencies of incendiarism. Neither is the amount of insurance considered, as the American offices seldom publish reports. Taken for all in all, however, the United States calculate their losses through fire, directly and indirectly, at not very far short of five or six millions sterling per annum; and they seem rather proud than otherwise of a fact so convincing as to their flourishing and their misfortunes.

It is an utter vanity to talk of such cities as models. They may spring up in a few

years; they may erect monster mansions and hotels; they may raise or reduce the level of their streets; they may move their houses upon rollers; they may do all which is American, and seems impossible everywhere else; but they are not scientifically or even scrupulously constructed. That great town, standing on the margin of a mighty lake, was three-parts destroyed in the course of a few hours, notwithstanding its celebrated waterworks, through the accident of a "little boy kicking over a lamp of kerosene oil." Twelve thousand buildings lay in ashes; four square miles were converted into a desert of tinder; and how? One writer, who has some claim to be heard, tells the story in this wise: he says—"The secret of Chicago's disaster, actually within her own established free limits, where wooden houses are prohibited from being built by law, lay in the almost universal absence of slate roofs. Owing to the great expense of slates, caused by tariffs in favour of some miserable specimens of slate quarries in the state of Pennsylvania, we are compelled, in fact, to roof our houses either with wooden shingles or with tar-felt paper, swabbed over with melted pitch, and then strewn with small gravel,"—all which, of course, must be taken *cum grano*, as the expression of an exasperated holder of Chicago property. But we can readily comprehend the details following:—"The heat of the sun causes the gravel in many places to sink into this pitch and expose it, as also where the paper is turned up against the interior of the outside walls, which always exceed the height of such a kind of nearly level roof, as used to be the case with the roofs of old Jerusalem, which were more safely paved with stone slabs in those ancient days of careful building and slow progress." This is exactly the point. It is careless building, and impatient, and hurried, and improvident progress that we have to think of in connection with these calamities which startle and alarm the entire world. "In Chicago"—this is from the pen of a Chicago proprietor—"how hopeless, when once the fire had got beyond the immediate control of the fire-department, to expect that a stone or brick building would stop or divert the raging flames, while their almost flat roofs of wood and pitch were ready to catch the falling embers, carried along and fanned into flames by a fierce and unrelenting gale." No confirmation could be stronger of the opinion that these American fires are attributable to defective, hasty, and flimsy construction. That which is called, in the rough idiom of the New World, "Uncle Sam's Estate," is not, in all respects, too carefully arranged. And one reason may be that the landlord, giant as he is, feels so confident in himself; he can rebuild nearly as fast as fire can destroy, and perhaps he cares less for his property than other people. For he holds, without fee, the soil of that immeasurable continent, and it is exhaustless in marble, in stone, in timber, in industry, in all that makes the wealth, and hope, and credit of great communities.

This Chicago, whose disaster has naturally excited so much of human sympathy, is really a wonder, no doubt; but a wonder not altogether to be approved. It stood as the banking capital of the great North-West, adding territory after territory, month after month, to its pay-roll, trebling its resources in a year, undergoing the most violent fluctuations, but always warned that it was a tinder-box, in spite of its brick and stone dwellings. The insurance interests of the city, always large, had become extravagant before this vast conflagration occurred. The vast accumulations of riches from the surrounding district, the endless warehouse facilities, the concentration of the provision trade at this point, the heavy stocks of merchandise required by traders to supply the enormous commerce of the North-West, rendered that Virgin of the Lakes a treasury of the Union; and proportionately melancholy is her ruin.

The city, in view of its character as a radiating centre, was, although so young, selected many years ago as the commercial and financial metropolis of the North-West, and a basis of all important operations for Ohio, Indiana, Michigan, Illinois, Wisconsin, Minnesota, Iowa, Nebraska, Kansas, Missouri, and Kentucky. Still, throughout the short history of its triumph, we note, from its own journals, confessions of the temporary career to which the architects of the city and its fortunes looked—"miscellaneous currencies;" "mixed and motley rag issues;" "wealth sold for trash;" "a greenback flooring;" and so forth, in the slang of the place and the time. These are not healthy signs. They indicate no solidity. We may fear, indeed, that they presage as much of moral as of material dissolution, amidst a state of things so crude and formless.

The action of the American genius, in most respects, while bold and inventive, is violent and irregular—witness the great Maryland Canal, designed to unite the waters of the Ohio with those of the Chesapeake. At George Town, which is at the head of tide-water and of the navigation of the Potomac, the river suddenly narrows, and there the canal is conveyed across to its southern bank by means of a stupendous aqueduct, the trunk of which is merely of wood, supported at an immense height above the flow of the stream by a few abutments of ponderous yet dangerous masonry. How this work has survived so long is a mystery to American engineers. But, like others, and like Chicago, it was intended to "tap the West." That is the secret, and Chicago was its complete illustration. It is very different in the south-west. There the Chicagos, so to speak, float upon the rivers. Their lumber vessels, usually laden with shingles, masts, spars, and boards, are the deal mines of Maine, though the forests are disappearing, and the earth is being searched for its ores. But they build upon a different principle, are less hasty, and employ less timber in their construction. Above all, they do not render solid walls worthless by roofs of wood and pitch.

THE NEW LAW COURTS.—II.

(Continued from page 262.)

THE COURT FLOOR.

THIS, the principal floor of the building, the arrangement of which has determined the arrangements of the floors below and above it, has its level varying from 17ft. to 21ft. above the floor of the Central Hall, and it contains all the courts. The Central Hall itself is connected with the surrounding parts of the building only at its south and north ends, and at its south end it has a gallery over the entrance; but the open spaces for light on its two sides, which also give light to the entire range of the bar corridor and to the northern consultation-rooms, are broken by four groups of additional consultation-rooms, two on each side, that abut upon its side-walls. The bar corridor, 9ft. 4½in. in width, is carried continuously across the two ends and along the two sides of the Central Hall, beyond and immediately adjoining the lateral light-spaces and the northern group of consultation-rooms. To the south, the central space over the grand entrance archway is flanked by consultation-rooms severally adjoining one of the three Courts of Exchequer and one of the three Courts of Common Pleas; the octagonal towers with the main flights of the public stairs leading to the courts' galleries and the lesser jury stairs being close at hand. The Equity and the Common Law Courts are respectively placed west and east of the central line of the building. The courts are arranged in the following order. On the west, commencing from the south, opening westward from the bar corridor, are in succession two Courts of Exchequer, the Courts of Divorce, of the

Admiralty, and of Bankruptcy, and the Court of the Lords Justices; and in connection with these courts are three flights of witnesses' stairs, and as many other flights for juries, which also provide access from the attorneys' corridor below; there are also large and small spaces for light, air, and smoke shafts, and appropriate conveniences. On the east of the eastern range of the bar corridor, corresponding with the aggroupment on the other side, are the second and third Courts of Common Pleas, the three Courts of Queen's Bench, and the Vice-Chancellors' or Appeal Court, with flights of stairs, &c., as on the other side. Beyond the northern range of the bar corridor, divided by another corridor leading, at right angles to the former, to a central entrance for the bar from Carey-street, are the two Vice-Chancellors' Courts, between the Courts of the Lord Chancellor and the Master of the Rolls, with their appropriate flights of witnesses' and other stairs, light spaces, &c. Beyond the courts is the judges' corridor, in width 6ft. 6in., carried round the entire building at a level of 5ft. above the inner or bar corridor, on the west and east, its long vistas being slightly broken by a light-space on each side with windows, while on the north it rises by steps and crosses the bar corridor; access from without the building to this corridor is obtained direct from the judges' own special entrances; and from the corridor, on its opposite sides, are doorways leading to each judge's rooms, and to the bench in his court. Also, adjoining each judge's own rooms are the rooms for his secretary and registrar, whose privacy, like that of the judge himself, is secured by the inviolability of the judges' corridor. This corridor also enables the judges to communicate in private with one another. The rooms which are ranged beyond the judges' corridor, include robing-rooms, wardrobes, and waiting and porters' rooms, with the judges' stairs, stairs to the Vice-Chancellor's chambers, and officers' stairs, also with light-spaces, &c. On the east side, it must be added, a room has been provided for the fifteen judges, and rooms for the Master of the Rolls and his secretaries close to the Vice-Chancellors' court. On either side of the bar entrance from Carey-street is the bar robing-room and the bar-room, or bar library, with private stairs leading down to the bar refreshment-room. The range of building to the east of the quadrangle, as in the floor below traversed by a corridor along its entire length, contains nine rooms for the Queen's Bench Masters and their clerks, with a hall for attorneys, lavatories, and stairs to the offices of the Taxing Master and the Queen's Remembrancer. Further north are the rooms of the registrars, chief clerks, senior and junior clerks, and their assistants, with lavatories, &c., and stairs; these rooms are 29 in number. Across the north end of the quadrangle is a range of five more rooms for a chief clerk, registrar, assistants, and under-secretaries and clerks, with corridor, service-room, &c. To the south of the quadrangle, over the entrance archway, is a second bar-room of large dimensions between open arcades; and beyond, in addition to a hall, there is group of rooms for various uses, to be occupied in the discharge of some of their duties by the high officials and others connected with the courts of law; but, as before has been stated, at this point the arrangements have not been finally completed.

FIRST FLOOR ABOVE THE COURT FLOOR.

This floor, the third above the basement of the building, has a level varying from 24ft. to 26ft. 5in. above the pavement of the Central Hall, which at the level of this floor stands on all sides absolutely clear of the surrounding masses of building except at its two southern angles. The flights of stairs for the general public in the octagonal towers which flank the main entrance from the

Strand, on this floor are connected with two public corridors, communicating with the public galleries in each one of the eighteen courts that encompass the Central Hall; but there is no communication from these public corridors, which are over the bar corridor, with any other parts of the building; it must be added, however, that there are two other flights of public stairs, one at the northern end of each direct and unbroken range of the public corridor. Beyond the upper parts of the courts, towards both the west and the east, there is a separate corridor, that may be distinguished as the "office corridor," to which access is obtained on each side by two flights of steps from below. Each of these corridors communicates with a range of 27 rooms assigned as chambers for the Vice-Chancellors, and offices for clerks of different ranks and assistants, with a library, waiting and service rooms, rooms for papers, several spare rooms, lifts, &c. To the south, east, and north of the quadrangle the ranges of offices and their attendant rooms, in all upwards of 50 in number (their precise number not being determined until the arrangements about the south-east angle of the building shall have been completed), will be assigned to Registrars in Chancery, the Queen's Remembrancer, the Exchequer Masters, and to various officials connected with their respective departments, with a library, rooms for visitors, service rooms, &c.

THE SECOND FLOOR ABOVE THE COURT FLOOR.

This, the uppermost floor of the building, with a prevailing level of 50ft. above the pavement of the Central Hall, in the main block contains ranges of rooms along the west, north, and east faces of the building, with continuous corridors facing on each quarter towards the Central Hall, and with access by five flights of stairs. The rooms, upwards of 60 in number, including a large arbitration-room with an adjoining reception-room and a range of spare rooms on the north, on the west are appropriated as offices for the probate registrars, and on the east for those of the Admiralty registrars and of the Marshal's office, with the Admiralty record-rooms, &c. To the east of the quadrangle, as on the lower floors, are double ranges of offices divided by a corridor; in number they are 35, with two flights of stairs, lifts, lavatories, &c.; they are to be assigned to the Taxing Masters, their clerks, and various assistants, and they include a library, fire-proof rooms, and some spare rooms. Near the south-east angle it is proposed to place rooms for stationers and for clerks and others connected with their department, with paper-room, stairs, lifts, &c.; but of the actual arrangements in this quarter on this floor, as on those below it, we shall speak hereafter, when we describe the clock-tower near the extreme south-east angle of the building.

Such is a concise general sketch of the plans for the several floors of this great edifice, as they rise one above another from the basement upwards towards the roofs. But, if the motive which influenced and guided the architect in devising and framing these plans is to be really understood in order that it may be consistently appreciated, the aggroupment and arrangement of the several floors must be examined and considered vertically as well as horizontally, and their relative connection with and bearing upon one another must be taken into account. In the main block, like the basement, the uppermost floor may be regarded as having a comparatively distinct existence and application—a sort of supplementary character, and the duty of supplying what had not been provided elsewhere. And yet even here the assignment of the offices in a great measure has at least been influenced by the uses of those parts of the building which are below them. In like manner, the arrangement of the long ranges of offices in the building to the east of the quadrangle has been deter-

mined in no slight degree by the consideration of the means whereby they might be occupied most advantageously with more or less direct reference to the courts in the main building. All these offices have been provided for the greater benefit and convenience of professional men practising in connection with the courts, in preference to their having to pass continually to and from the courts to their own chambers or private offices; and, in addition to the general fact that such provision has been made for them under the roofs of the New Law Courts, professional men and official personages will find that the positions of their rooms and offices in the new building have been fixed with the most thoughtful care for their several requirements. Like the advantages conferred on various professional men by offices and consultation and other rooms being provided for them in immediate connection with the courts, will be the effects of the concentration of the courts themselves upon the judges, the bar, and various classes of persons whose affairs and duties may call them to one or other of the courts. When the new building shall have been completed and shall be in use, the judges will always discharge their high functions on common ground and near to each other; and counsel will no longer have to hasten from a court in one part of London, anxious to be in time for a fresh case in another court situated at a considerable distance. Unity of action in the supreme courts of law will have, not only a dignity of its own, but also many special advantages of great moment peculiar to itself.

The court floor—itsself the key to the whole group—and the floors immediately below and above it, in their combined arrangement exhibit the practical development and application of a single idea. For as the entire building is designed to be complete as “the New Law Courts,” so is each one of the courts (which collectively constitute the one great whole) to be complete in itself—complete, that is, in all that can be required or even desired in connection with the administration of the law in a supreme court of law in the metropolis. The Central Hall—true to its own distinctive appellation—being and having been assumed to be the centre of the building from and around which the courts in their order should radiate, each of these courts becomes in its turn the centre to what may rightly be entitled its own system. What the architect of the New Law Courts had to do, then, when he had determined on the primary condition of a Central Hall, was first, to plan out one court, to determine its form, size, and proportions, and to adjust both the positive and the relative positions of the approaches to it. Then, in the second place, he would proceed to marshal around this court and below it, and in its immediate neighbourhood in the next higher floor, the entire series of its structural accessories and dependencies. The judge would first engage the architect's attention. He must have a suitable entrance from without into the main building, quite distinct from the principal entrance to the Central Hall; he must have a private apartment, becoming in its character and conveniently situated, with a robing-room, and their own rooms for his special official attendants, his secretary and registrar; he must have due provision made for his personal comfort, as also for ready access to his seat on the bench in his court; and, while his personal privacy would be secured with proper jealousy, the judge must be enabled—his official privacy being still secured to him—to consult with any one of his brother judges, or with several of them, or even with them all. Again, as complete provision must be made for all becoming privacy for each judge and for all the judges, so, on the other hand, there must be readily available means of access to each judge for those persons connected with the administration of the various duties of a

judge's office, with whom under widely differing circumstances any judge may require to be in personal communication. In his arrangement of the judges' entrances, stairs, corridor, and rooms, Mr. Street has thoroughly realised all that the judges themselves could desire. The judges' corridor, from its admirable arrangement, demands especial notice and the very highest commendation. In connection with that rigid exclusiveness which distinguishes the judges' corridor, and is its peculiar feature, inasmuch as it restricts its own action to its own specific and regular duties, reference must be made to Mr. Street's thoughtful and judicious provision for contingencies that must constantly occur in cases in which attorneys with their clients (or other persons) may have to consult a judge. If the judges' corridor could be made available in such cases, it would cease to be inviolable—cease to be, what it was to be and what it is, a judges' corridor at all. Accordingly, when a judge is to be consulted privately, ready access to any judge's room may be obtained (quite irrespective of the judges' corridor) by the officers' stairs or from the witnesses' stairs through the mezzanine. Once more, with no less of care and judgment, corresponding provisions would have to be made, and in each case made with a special view, for the members of the bar, for attorneys and their clerks and their clients, for juries, for witnesses, male and female, for very numerous officials, and for the general public, of which classes of persons each one would require to be treated both individually and in connection with every other, as all would have to be considered with a common reference to a court, or, perhaps, to all the courts. On a judicious distribution of the rooms, below and higher than the courts themselves, and especially on a skilful adjustment of stairs, corridors, and passages, to some of which secondary as well as primary uses might advantageously be assigned, the successful provision for so many complex requirements would mainly depend; and here Mr. Street has achieved a masterly success. One particular instance may be adduced to exemplify the care with which he has not neglected very exceptional cases. The general intention is that the public should be present in any court in a public gallery specially set apart for their reception and accommodation, and in connection with which there are separate flights of stairs and separate corridors for approach. But some judge may choose to admit the public also to the body of his court, and thither the public stairs and corridors would not lead. In such a case as this other public means of approach to the body of any one of the courts are at hand, and available by means of the witnesses' stairs, so that an order such as has been supposed from any judge could be obeyed at once, and without any confusion or difficulty, or any serious interference with the plans of the building, or with the usages generally prevailing within its walls.

With extreme gratification we record the testimony unequivocally given by the judges themselves, by the heads of the departments, and by official personages of every rank and order, that in all the diversified and complicated arrangements incidental to the plans for so great a building, both in their separate and in their collective capacity, Mr. Street has been eminently successful; and it has been particularly noted by others besides ourselves who have carefully and minutely examined them, that Mr. Street's arrangements, while they appear to have omitted nothing, are no less distinguished for a prevailing simplicity than for comprehensive completeness. By order of the Government, before the plans were finally accepted, a specimen court was selected for trial by means of a model. A model, accordingly, was constructed, with the adjoining rooms, stairs, corridors, &c., in connection with the court itself, the whole being in exact accordance

with Mr. Street's plan—a portion of his building on a small scale. This model, explained by the architect, and which also was fully competent to explain itself, was minutely examined by some members of the Government, and particularly by the Chancellor of the Exchequer, by some of the judges, and by other official personages; and in the working of each of its component parts, as also in the combined action of all its parts, the model was unanimously declared to fulfil every requirement in the happiest and most satisfactory manner. The typical court, thus planned, and thus proved to fulfil its duties, the architect repeated for each of the whole series of courts in succession around his Central Hall, with certain slight modifications in some instances, such as might be demanded in certain positions on the general plan, and by special conditions of circumstances. Thus each court in all its essential features is a counterpart of every other, so that familiarity with the arrangements of any one court would imply corresponding familiarity with the arrangements of each of the others; at the same time, lest this resemblance should ever prove to be perplexing, instead of being a source of advantage, the walls that enclose the witnesses' staircases on the west side of the central hall have a polygonal plan, while the plan of those on the east side is semicircular; and thus the groups of courts on the two sides of the central hall may readily be identified. To the entire group of the eighteen courts, again, some few additions had to be made, having reference to all the courts collectively; such are the bar-rooms, and the conference, consultation, and arbitration rooms.

We do not remember to have observed in the *Times*, or in the remarks of any other critic hostile to Mr. Street, any allusion whatever to these plans, and to the provident thoughtfulness and consummate ability displayed by the architect in his arrangement of them. Perhaps we overlooked what the critics wrote upon this pre-eminently important point; for we can scarcely imagine such exalted critics, who claimed for themselves plenary authority, to have overlooked or ignored the grand point of all in the designs which they condemned without even the faintest recommendation to mercy.

THE ELEVATIONS.

When a general estimate is formed of any one of the elevations of the fronts of the New Law Courts it will be kept in remembrance that the average length of each of them is about 500ft., and consequently that it will not be possible for the entire architectural effect of a whole front to be seen at once from any one point. Hence in each front the design has to be considered as well in its effect when seen from two or three different points, as when the whole is visible at once in a drawing or engraving. In each of his fronts Mr. Street's design will be found to endure with equal success an examination of the whole as a whole, and a separate examination of such portions of any one whole front as may advantageously be seen from particular points—say any 100ft. or 200ft.—which is as thoroughly effective in and by itself as the whole 500ft. is thoroughly effective also. Nothing could be happier than the varied yet always harmonious balance of parts that pervades all these fronts, and contributes in so high a degree to the effectiveness of each one of them; and equally happy also is that subordinate balance of parts that invests with a peculiar value and dignity the principal component members of each front. When studied in succession, and due attention is given both to the palpable evidence of unity of principle and to the recurrence of familiar details, all the fronts are seen to belong to each other and to the same edifice, as with equal impressiveness each front declares its own completeness as being in itself an independent composition.

As we have been using the word “fronts,”

it may be well for us here to observe (for the special behalf of the critics of the daily newspapers) that a building about 500ft. square, such as the New Law Courts, has more fronts than one; and, indeed, since its plan includes a great open quadrangle in addition to its four external fronts, this particular building has the same number of fronts facing inwards to the quadrangle—eight fronts, therefore, in all. And more even than this, the great Central Hall has three independent elevations of its own—its two sides, that is, and its north end; its south end forming a part of the Strand front of the entire building. We have further to add, as there has been no necessity, either architectural or arising from any other source, that any two of the fronts of this building should be alike, that no two of the main fronts are alike: in fact, each front, based upon its own requirements and accomplishing its own purpose, is a distinct composition. From these very simple yet decidedly significant facts is deduced the conclusion that when the *Times* and its allies and followers criticised certain unfinished parts of a single front, and held those parts to be "the design," unquestionably meaning Mr. Street's complete design for the entire building, they unconsciously but conclusively proved their own criticisms, whether adverse or laudatory, to be equally worthless.

In designing his elevations, as in framing his plans for the New Law Courts, it has been Mr. Street's aim always to assimilate the architectural character of each part of the building to its own special purpose and function, that the architecture might be gifted with the faculty of speaking for itself concerning its own purpose and its own practical associations. Thus, the more dignified the use to which any particular parts of the building might be assigned, the greater also is the dignity with which the external architectural features are endowed. On this principle, in the west, east, and north fronts, for example, the windows of the judges' rooms are distinguished by being enriched oriels or bays; and on the same principle the entrances and the windows which light the flights of stairs severally assigned to the Lord Chancellor and the Judges, to the Vice-Chancellors, and to the officers of the courts, exhibit three distinct gradations of architectural rank. So far as the compositions of the several fronts of the building are concerned, the courts themselves (which give its title to the edifice) are conspicuous from their absence. This result is connected with that condition of grave importance in determining the position of the courts, which refers to securing for them freedom from interruption by noise from without. With a view to preserve for them the necessary silence, the architect has withdrawn his courts as far as possible from the streets, as he also has interposed open spaces and corridors between them and the Central Hall. In accordance with this feeling, an open space of considerable extent will range along the western front of the building, and on the east there will be 50ft. of open ground between the eastern front and the line of the buildings in Bell-yard. All the elevations are alike in being remarkable for the proportion between the windows-openings and the intervening wall-spaces being such as will give light in the most generous abundance, this proportion sometimes being almost as one to two. It is also to be particularly observed that every window has both its size and its position determined from within. The windows are large or small, of a single light or of more than one light, as the rooms to which they would give light might require. Instead of having been drawn for architectural effect, in telling positions, and with skilfully-adjusted variations of size and form, and then made to fit the room or the rooms made to receive them as they best might, and sometimes under very unfavourable circumstances,—where the windows would be wanted there they will be

found; and whatever duty any window ought to discharge, it will prove itself equal to discharge that duty to the best advantage in combination with the happiest effect. Throughout the building a feature of great beauty prevails in the grouping together each pair of windows, one below and one above, in the upper two ranges under a single arch. This truly felicitous arrangement, which is carried out in all the details with singular skill and the most refined taste, sometimes extends to other parts of the building also. Without being embattled, the parapets are generally simple, sometimes diversified with various appropriate enrichment, in their rows of corbels, and always effective. The roofs have a high pitch—not too high, and are crowned with ridge-cresting.

As a matter of course, the engravings which we soon shall be enabled to give from Mr. Street's drawings, and which will include numerous details, will convey correct ideas of the elevations of the New Law Courts infinitely better than we can hope to do in words. Still some verbal descriptions will consistently prepare the way for the engravings, as the two when considered together will mutually illustrate each other. We purpose, accordingly, to proceed to treat of the several elevations in succession, commencing with the Central Hall, and leaving the Strand front ("the front") till the last. The task, by no means easy, is truly gratifying. Indeed, it is more than gratifying to be able, strictly upon the merits of the case before us, to vindicate the signal worthiness of the designs of an artist of acknowledged eminence, who has won his way to a foremost place in the front rank amongst his brethren, and who is deservedly held in very high estimation; to be able, also, in so doing, to meet and confute criticisms that were equally unjust and ungenerous, and to show that in their approval and acceptance of these designs for the New Law Courts the Government have done a good deed, and may rightly claim to be cordially supported in their decision. It is indeed more than gratifying to follow the train of thought of a master mind, expressed under noble forms and beautiful images, and unfolding a grand idea in just, harmonious, and dignified proportions; to observe how, with genuine originality of conception and treatment, a great English design is maintained in strict conformity with the essential truth and purity of the Gothic of England as a style—the national style—of architecture; to see in details the most varied beauty, simplicity, and a felicitous appropriateness always present together; and, in a word, to discern in this same great design, throughout its manifold parts, evidences of an exuberant richness of resources combined with an ever-fresh versatility and a constant harmony in the application of them.

(To be concluded next week.)

DESIGN FOR NEWCASTLE CATHEDRAL, NEW SOUTH WALES.

THE design of which we publish a plan and a transverse section, together with a part of the side elevation, was submitted in competition for the above building by Mr. J. Horbury Hunt, of Sydney. It appeared, however, to the building committee to be too extensive for their means, but they entrusted Mr. Hunt with the superintendence of the works actually decided on. These have since come to a standstill on account of a general depression in the affairs of the colony; and when the building is again proceeded with, it will probably be on some modification of the plan now published. Mr. Hunt, in his report to the committee, mentions the assistance derived from Mr. Beresford Hope's "English Cathedrals of the Nineteenth Century," and gives a detailed explanation of the means by which he purposes to screen the walls from the effect of sun and driving storms. The general principle adopted—that of double walls and surrounding cloisters—has been adopted from early times in many of the Byzantine churches of Turkey and Asia Minor, and has been recently revived at Brisbane, Colombo, and the Memorial Church at Constantinople. The nave is seven bays long, and appears to have an apsidal

termination at the west end. How this is managed, either inside or outside, we are unable to say, not having received from Mr. Hunt either an external view or a complete longitudinal section. The nave is 51ft. wide from centre to centre of the columns; the side aisles are barely 5ft. wide in the clear, a dimension too small even for convenience, and, compared with the nave, much too small for satisfactory effect. Mr. Hunt's plan has the great merit of putting the whole congregation within view of the service; but the difficulty is always to do this without injuring proportion and artistic character. In the present case we incline to think that no aisles at all would be better than aisles only 5ft. wide. In a church with a 30ft. nave they might pass, though even Mr. Brooks, at St. Columba's, Kingsland, has not been satisfied without a 7ft. passage. But everything is relative, and what would not be disagreeable in a moderate-sized building may appear absurdly diminutive in a large one. In this design we more than question whether, in any sense, the nave arcade would be worth its cost, and whether it would not be better to follow the system adopted at Gerona, and roof the church from wall to wall. Saving in this way the space now occupied by the nave piers, the entire width within need only be about 56ft.; and if a vault, or even a ceiling of sufficient importance were stretched across this space, there would be no need to regret the absence of the usual arcade. The narrow-aisled type of church has much to suggest for certain purposes; but when pushed too far both the use and the beauty of the nave arches become vanishing quantities. On the system which includes Alby, Gerona, and other vast one-span churches, it has been a difficulty, for modern purposes, to make any use of the recesses between the deep buttresses. The present design, however, would naturally retain them for the purpose already intended—namely, to form a cloister for the protection of the walls from the burning heat of the sun. The buttresses already shown are almost large enough to resist the thrust of a vault, and the alteration suggested would give an incomparably more monumental character to the work at a comparatively slight extra cost. The details throughout require study and revision; the tracery shown in the clerestory windows is poor in design, and the management of the buttresses and their pinnacles not satisfactory. The merit of the plan lies in its adaptation to the purposes of a congregation; it remains, as we think, to work it out in its separate parts with thoughtfulness and skill.

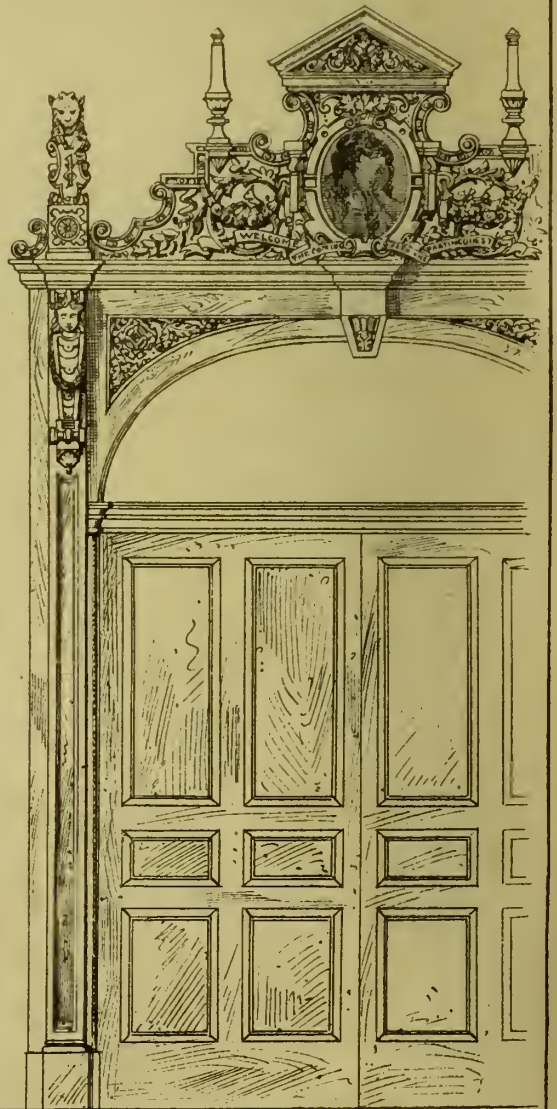
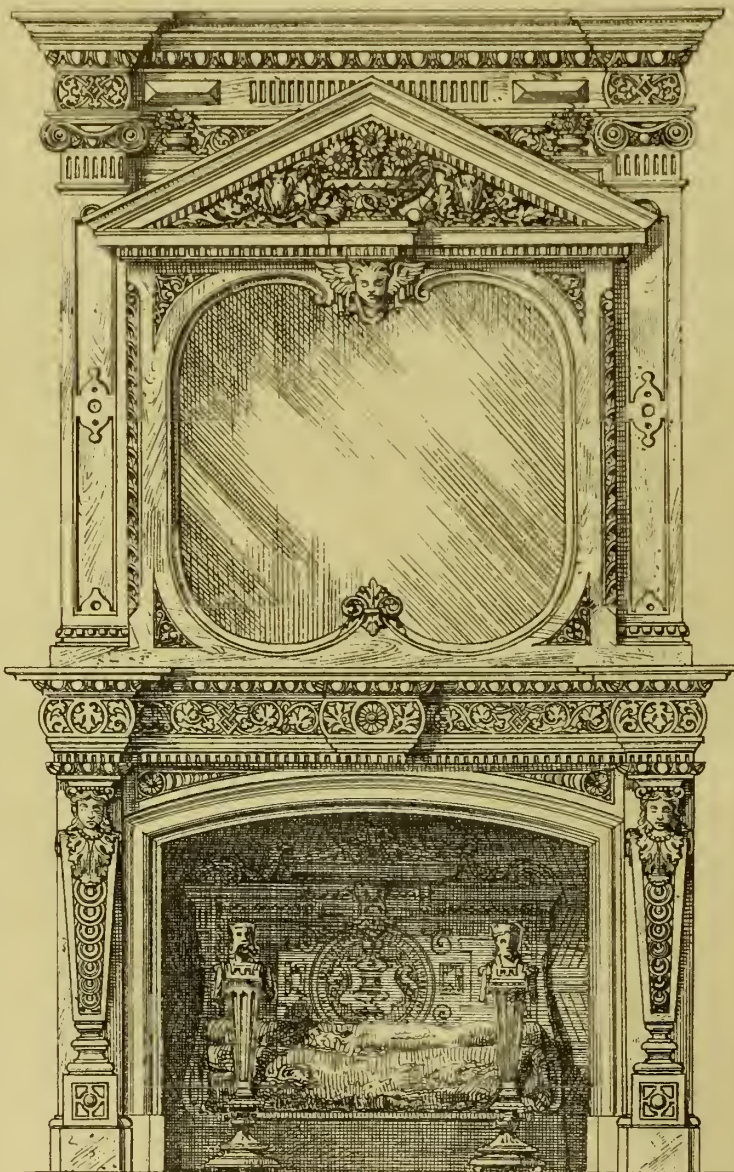
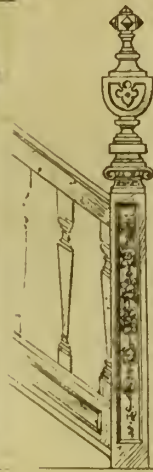
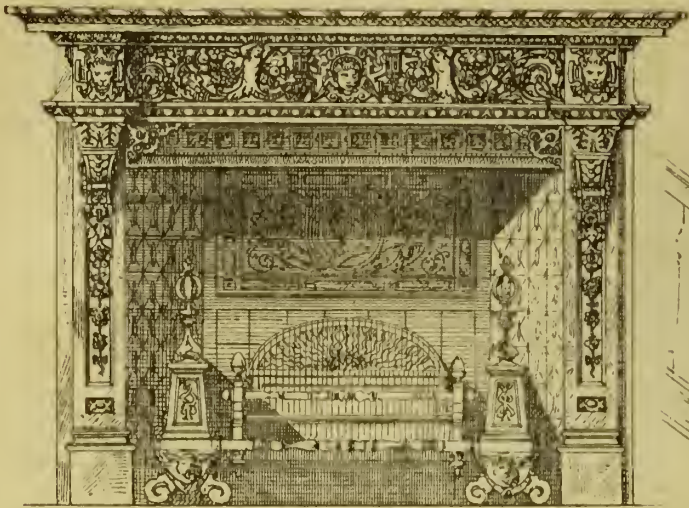
CARVED WOODWORK.

ONE of our lithographs this week illustrates some carved woodwork executed by Messrs. Cox & Sons, Southampton-street, for Henry Robertson, C.E., from designs furnished by S. Pountney Smith, architect, Shrewsbury, assisted by O. W. Davis. The hall chimney-piece, which is carved in oak is about 16ft. high, and is massive in its construction and details. The other chimney is for the dining-room, and is also carved in oak.

VAL DE TRAVERS ASPHALTE A FAILURE.

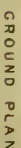
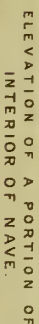
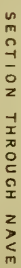
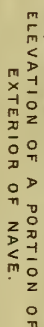
WE see that the shopkeepers and others of the Strand and other parts of London are petitioning to have certain thoroughfares paved with asphalt. Now, considering the many advantages attending the use of this material for paving purposes, we are not surprised at the growing feeling in its favour, and particularly just now after a summer's experience. But we entreat all who are asking for its more extensive application to pause a little. Let them have the experience of winter as well as summer before they decide. When passing through Leicester-square yesterday (October 19) about mid-day, we saw that hundreds of people had collected. We thought at first that some procession or other spectacle must be coming. We were, however, soon undeceived, for the horses while passing over the asphalt pavement were falling down so fast as to excite a great deal of public attention and curiosity. Though we were not present more than a few minutes, several horses slipped and fell during the time, and others that did not fall were in peril of falling while passing over the pavement. Some cabdrivers as soon as they got on the asphalt cautiously turned back again, others turned away at the very first turning, and all that passed over had to do so slowly and with extreme care. We don't know whether the same kind of pavement in other parts of London is so dangerous during humid weather as that recently laid in Leicester-square: if so, the demand for tearing it up will very soon be stronger than that for laying it down. No doubt Val de Travers' asphalt is very good for Continental cities, but for London and other large English cities during winter, it will be found altogether unsuitable.

CARVED WOOD WORK FOR H. ROBERTSON ESQ^r LLANDERFEL CORWEN



EXECUTED BY MESS^{rs} COX & SONS SOUTHAMPTON STREET STRAND.
FROM SKETCHES BY S. POVNTNEY SMITH DETAILS BY OWEN W. DAVIS.

J. HORNBURY HUNT, ARCHITECT, SYDNEY.



NOTES ON CARPENTRY AND ON STRAINS IN STRUCTURES.—X.

WE will conclude these notes on carpentry with a reference to a heavy class of work. In the East Riding of Yorkshire, and in Lincolnshire—as well, indeed, as in Cambridgeshire and other counties—large drainage works are necessary to bring into and to keep the land in a fit state for cultivation. The outfalls of these drains, which in many cases resemble rivers, are navigable, and communicate with tidal rivers. It becomes, therefore, necessary to have at the junctions of the drains with the rivers such gates as will keep in the water to a regulated height, and yet allow excess of water to pass out when the tide permits, and at the same time such gates as will prevent the rise of the tides flowing up the drain. These works are generally called sluices, and are for the most part of masonry, but there is a good deal of carpenter's work about them; for instance, the pointing gates, the draw doors, the piled foundations of the masonry, the aprons, and the coffer dams.

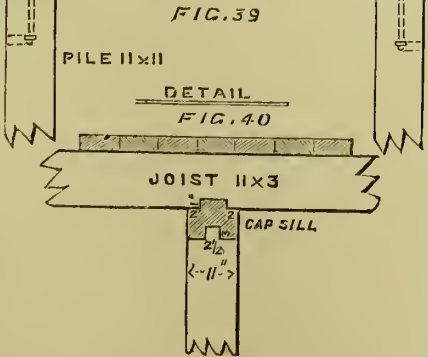
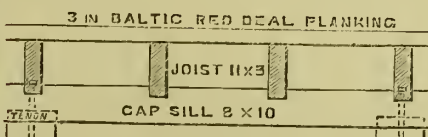
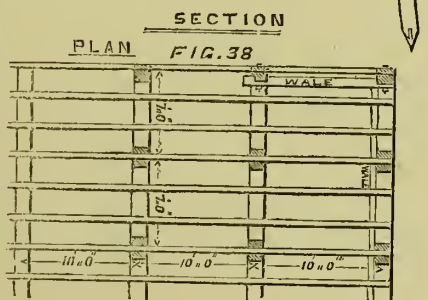
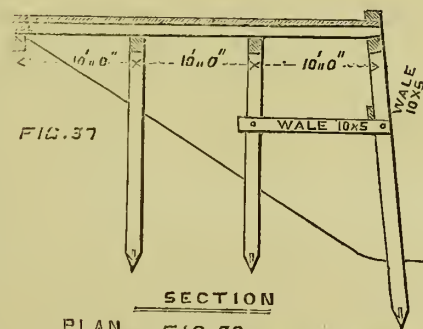
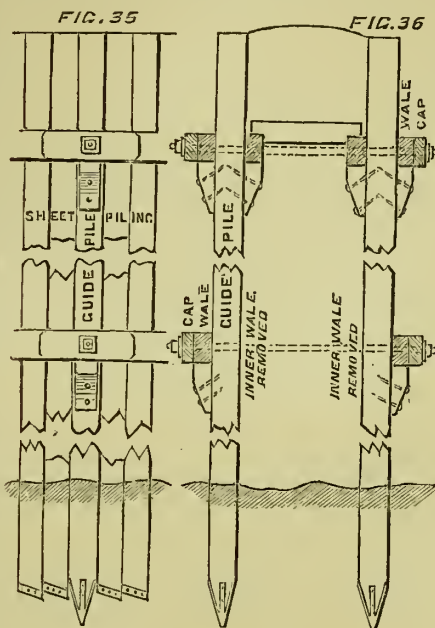
To keep out the water while the foundations are being laid, and the work brought up above the water-level, temporary dams of clay, enclosed within two rows of close piling, are employed. Before a row of close piling—generally called sheet piling—can be driven, horizontal timbers, called walings, must be fixed for a guide, and before the walings can be fixed piles must be driven at intervals to which to fix them—guide piles. The guide piles, then, must be first pitched and driven at the proper distance apart lengthwise and crosswise of the dam; 10ft. is a common distance lengthwise, and 6ft. crosswise. There should be at least two tiers of walings to each row of guide piles, in order to guide the sheeting piles straight when driven, and where the sheet piling is of great length, three tiers. If the sheet piling is intended to be of whole barks, the walings should be placed on each side of the guide piles; the sheeting piles are then driven in the same line with the guide piles, between them. The sheeting piles should be sawn straight (slabbed) on the two sides that are to come together. This is necessary to protect the clay puddle, which will be filled in between the two rows of piling after the carpenter has done his work, from being washed away or dissolved at the joints by the water outside the dam, and cracked by the sun on the inside, both of which must be prevented, and therefore the sheet piling must be close jointed. The work of the carpenter, indeed, is to make a framework to contain the puddle wall, and to keep it intact.

If the sheet piling is to be of half barks or less, it could not be driven between and in the same line with the guide piles, which are generally whole timbers, unless the walings, if placed on both sides of the guide piles, were let into them to a sufficient extent to reduce the space between them to the thickness of the sheet piling; and as coffer dams are only temporary structures, and as waste of timber or any other material is to be reprehended, the walings in this case are both placed on the inside of the guide piles, being kept apart by distance pieces behind the guide piles.

The walings are supported on chocks, spiked to the guide piles. The guide piles are cut to a point, but the sheeting piles are cut bevelled, so that in driving the tendency is to draw each pile close after the one driven before it. The ground is usually too hard to allow the piles to be driven without being shod with iron. If the shoes are of wrought iron care must be taken that they are driven on as far as it is possible, so that in driving the piles they cannot be displaced. If the shoes are of cast iron, a square seat will be provided for the toe of the pile, the point of which is to be cut off so as to give a solid bearing to the pile. The last operation before driving the piles is to round off the edges at the

top, and drive on a hoop to prevent splitting in driving.

When the piles have been driven the two sides of the dam are held together against the pressure of the clay puddle by bolts passing through all, and at the joints of the walings, through a capping piece which takes



hold of about 2ft. of the end of each wale. The bolt-holes through all these timbers should be bored rather small, so as to require the bolts to be driven through them, otherwise water will leak through the dam along the sides of the bolts.

Before the clay is filled in, the carpenter will be called to remove the lower tiers of inner walings, so that the puddle shall not hang upon them, as it would do if they were left in, forming hollow spaces under them. Fig. 35 is an elevation, and Fig. 36 a cross section of a coffer-dam such as we have described. The dredging, puddling, and other work, not being carpenter's work, is not here gone fully into. If we have anything to say about earthwork in future notes it will be there described.

No dam would stand against a considerable head of water outside unless it were strongly shored up from within. If the dam is short, it may be supported by diagonal struts from the shore, but where it is of considerable length counterforts of piles and framing are to be placed at short intervals. In these counterforts strength is an absolute necessity, and the timbers should be so cut and placed as to receive direct strains. In bracing a frame the braces are sometimes merely placed alongside the sills and uprights, and a bolt is passed through them. Now this is a weak and ineffectual method. A cross strain is thrown upon the bolt, and if the pressure be great the bolt will be bent, and the brace will give way. The brace should abut against the other pieces with square shoulders, and bolts be used only to keep them in that position.

A good deal of carpenter's work is done in the construction of river-side jetties. Figs. 37, 38, 39, and 40 show an example of a small one. If it had been pushed further out into the river, the piles would have been braced. The timber chiefly used for this kind of work is Baltic fir.

THE ARCHITECTURAL ART CLASSES.

WITH the present month the season again comes round for the meetings and classes of the various architectural societies. October is a busy time for the officers who have to prepare the lists of papers and to lay down the work for the ensuing session. The joint committee which has been appointed to arrange the programme and to carry out the scheme of art training for architectural students, is early in the field with its proposals for the formation of classes for the study of ornament and figure-drawing at the Architectural Museum. Our readers will remember that more than twelve months ago the Royal Institute of British Architects, the Architectural Association, and the Architectural Museum, nominated certain of their members to form a joint committee, entrusted with the management of the Architectural Art Classes, and that after a very prosperous session these classes closed for the summer vacation in June last. Owing to pressure of business, the energetic secretary of these classes, Mr. Lacy W. Ridge, has been compelled to resign his post in favour of Mr. T. H. Watson, the ex-President of the Association. Since the constitution of the committee, the Rev. Lord Alwyne Compton, and Messrs. Blomfield, Ruskin, Perry, and Spiers have retired, and Messrs. Gambier Parry, Pearson, Godwin, Florence, and Plumble have succeeded them.

At the beginning of next month the classes will reopen for three evenings in the week. Mr. Weeks will take charge of the figure-class, as before, and a committee of visitors has been appointed to carry on the ornament class. As this committee includes, among others, Messrs. Alfred Waterhouse, J. P. Seddon, E. W. Godwin, W. Burges, Tarver, and Watson, who will take it in turn to attend the meetings on Thursday evenings, in order to give their assistance and advice to the students engaged in drawing from the cast, it will be strange indeed if the classes are not very numerously attended. A slight alteration has also been made this session in the constitution of the managing body. Thus, in lieu of the large joint committee of sixteen members, a working committee has been

appointed which, in addition to six members of the joint committee, will include the names of two of the most active students in each class, who will thus have a direct voice in the management of the undertaking. It was originally proposed to set on foot classes for architectural modelling and for perspective; but enough members could not be obtained to make either of these subjects a success. This seems to us strange, more especially in the case of modelling, which is a most delightful pursuit, and one of great value to the architect. Mr. Morris, who had offered to become the instructor of this class, and who would doubtless still be willing to assist, was, as our readers will remember, the artist who modelled the admirable terra-cotta enrichments for the Wedgwood Memorial Institute at Burslem.

It would be very sad if, after all the cry that has been made for so many years for a "School of Art Accessorial to Architecture," that after such a school has been started, at great trouble and expense, it should die out for want of sympathy among architectural students. The days fixed for the different subjects are, for ornament Tuesdays and Thursdays, and for the figure, Tuesdays, Thursdays, and Saturdays, from 7 to 9.30 p.m. The fee for the figure-class is 7s. 6d. per month; that for the ornament-class is 2s. 6d. Any student of the Museum or member of the Architectural Association enrolled in these classes may draw in the Museum during the daytime, when the building is always open. The hours specially fixed for the ornament-class on Tuesdays and Thursdays is from 3 to 5 on the former day, and 7.30 to 9 p.m. on the latter. Prizes of the value in all of seven guineas are offered for the work of each session. Those members attending the classes who do not belong either to the Association or to the Museum will have to pay an entrance fee to each class of 2s. 6d., which is to cover the cost of admission to the Museum during a period of four months. Another very attractive feature of the scheme of art classes is the delivery of lectures upon the magnificent collection of casts on Saturday afternoons. Last session there were two such lectures, the one by Mr. Seddon, on "The Casts in the Museum Specially Illustrating the History and Principles of Foliage and Architectural Ornament," and the other by Mr. W. Burges, on those "Specially Illustrating Figure Subjects and Grotesques." It is intended to arrange for similar lectures during the present session.

The opening meeting will take place on Thursday, November the 2nd., at 8 p.m., when the prizes obtained during the past session will be distributed, and all those interested in the classes are invited to attend. In the meanwhile the Secretary, Mr. T. H. Watson, will answer any letters on this subject which may be forwarded to him at 9, Nottingham-place, W.

LARGE SPAN ROOFS.

IT is to be hoped, on æsthetic grounds, that the mania for erecting gigantic single-span roofs has culminated in Mr. Barlow's example at the S. Pancras terminus of the Midland Railway. However great the ingenuity displayed by their constructors in spanning areas of maximum width with a minimum quantity of material, such roofs as the one at S. Pancras and those on the north bank of the Thames at Charing-cross and Cannon-street are great eyesores. The lofty and unbroken line of roof shuts out everything behind it, and detracts from the picturesqueness of the scene, as every one in the habit of frequently crossing the Thames bridges Cityward will testify. Many of the numerous steeples of the City churches have been quite obscured from the view of the passenger across Southwark and London bridges by Mr. Hawkshaw's Cannon-street roof, which æsthetically has, it is true, one redeeming feature when compared with his roof at Charing-cross, viz., the towers at the angles nearest the river. It has often been said that such wide-span roofs were erected from considerations of economy, but if it can be shown that it is bad, or at the best doubtful, economy to construct such roofs, we may hope that no more of them

will arise to make London hideous. Utility, certainly, does not demand these huge single spans—witness the Paddington terminus of the Great Western Railway, and the new London-bridge terminus of the Brighton Railway, both of which seem admirably adapted for the large traffic which they serve. Our contemporary the *Engineer* says there is no question but that engineers are beginning to recognise that large span bridges, gigantic roofs, and enormously heavy castings are very bad economy, and should be resorted to only when there are no other means of accomplishing the desired object. Mere size is not, and never was, the highest criterion of engineering ability on the part of the designer, and the history of the Great Western Railway is a lamentable instance of the practical ill-success of the adoption of such a standard. It is always preferable to avoid taxing the resources of the foundry and the workshops beyond their legitimate means. When no other method of effecting an object is available, an ingenious *tour de force* is very commendable, and a judicious departure from the beaten track completely justifiable; but when the necessity does not exist, there is no excuse for incurring the risk, and should accidents occur, there is less excuse for them.

BELGRAVIA AND SOUTH KENSINGTON NEW ROAD.

THE *Morning Post* puts in a plea for this undertaking. It understands that the promoters of the long-desired improvement purpose making another effort to carry it into effect. The powers of the company for the acquisition of the necessary land expire shortly; but it is stated that another (the fourth) Act of Parliament will be applied for in the coming session, if the Metropolitan Board of Works determine upon aiding the undertaking by granting such a sum in aid as to make its execution a possibility. It has hitherto been found impossible to put the powers granted by Parliament into effect in consequence of the costliness of clearing the ground and compensating the numerous lessees and sub-lessees who have interests in the land of the proposed route. It is affirmed that there is an absolute necessity for a thorough communication between Belgravia and the important new neighbourhood of South Kensington, and every year increases the necessity as the attractions of the latter increase. Since the formation of Grosvenor-gardens the access from Eaton-square to the Victoria terminus and to the Houses of Parliament is complete; but between the former and South Kensington the route is still through a labyrinth of tortuous side streets. Between the two exists a tract of waste land which, in effect, completely isolates these important districts. The Legislature have by three Acts of Parliament affirmed the urgent need for and approval of the proposed road, but it has been found impossible, in a pecuniary point of view, to carry the Parliamentary powers into effect. The company have, in fact, acquired a white elephant, but our fashionable contemporary trusts that the time has arrived when the Metropolitan Board of Works may see their way to granting such aid as will render practicable the carrying into effect this long and much-desired thoroughfare. If the present opportunity be lost (the property being tied up for some sixteen years) it is feared that another generation will pass away before it can be carried out.

DUBLIN MUSEUM.—Sir Arthur Guinness, the principal if not the sole proprietor of the Dublin Exhibition Palace has, it is said, resolved to convert it into a public "Museum of Art, Industry, and Manufactures." The building, which was purchased by Sir Arthur Guinness about a year ago, at a cost of about £60,000, has, since 1865, when an International Exhibition was held in it, been devoted to purposes of public amusement, with, however, indifferent financial success. The intention now is to convert it into a permanent museum, as closely as possible in imitation of the South Kensington Institution. There will be a Loan Collection and a Sale Collection, both consisting of works of art, industry, science, and of miscellaneous articles. The one portion will be contributed by noblemen and others who are anxious to promote the object in view—art education; and the other by manufacturers. The promises of contributions to the Loan Collection are said to be already numerous. A fine collection of marble statuary, contributed by a citizen of Dublin, has already arrived from Rome. The sale collection will consist of "English and foreign manufactures, scientific inventions, pottery, porcelain, paintings, photography, sculpture, &c." The ceramic departments already contains a collection of Worcester porcelain, embracing in an unbroken series specimen of the ceramic manufacture of that city from 1751 to 1871.

Building Intelligence.

CHURCHES AND CHAPELS.

BRIXTON.—S. Matthew's Church has recently been reopened after undergoing thorough repair, and being decorated with ornamental colouring throughout the interior, from the designs and under the superintendence of Mr. E. C. Robins, of Southampton-street. Mr. McLachlan was the general contractor, and Messrs. Green & King executed the decorative work.

DUFFRYN.—A new church, dedicated to S. Matthew, has been completed at Duffryn, from the designs of Mr. Norton. It is a Gothic building, and Pennant stone is used, with Bath stone dressings. The altar is of Kilkenny marble, and the pulpit is of stone, with alabaster crosses in the panels. Mr. R. Roderick, of Margaur, is the builder.

HUDDESFIELD.—On Saturday last the cornerstone of a new Congregational church was laid at Huddersfield. The church, which will be built of stone from the local quarries, will hold 700 persons, and it is estimated to cost about £4,000. The architects are Messrs. John Kirk & Sons, of Huddersfield and Dewsbury.

LIVERPOOL.—A new Baptist Tabernacle was opened at Toxteth Park, Liverpool, last night. The building, which is in the Italian style, is constructed of gray bricks, relieved by the introduction of white and blue bricks in the arches, cornices, and other parts of the building, the dressings being of white Stourton stone. The elevation is divided into three spaces corresponding with the lines of the columns and central nave of the interior; the central portion, 37ft. wide, projects slightly beyond the main building, and is divided into compartments with pilasters having carved capitals, from which spring three arches surmounted by an entablature and pediment, the side spaces or wings being repetitions of one bay of the side elevations. The chapel is 79ft. long, 67ft. broad, and 37ft. high to the centre of the roof, fitted with galleries, and arranged to accommodate about 1,300 people. Messrs. Haigh & Sons, builders, of Liverpool, were the contractors for the work, which has been satisfactorily carried out according to plans prepared by Mr. W. J. Mason, architect, of Castle-street, Liverpool. The tabernacle, with the land, will cost about £7,000.

MIRFIELD.—A new church built at Mirfield at a cost of £25,000 was consecrated on Friday last. Mr. George Gilbert Scott, of London, is the architect. The style is Early English. The plan consists of nave and aisles, chancel, south porch, tower, and two vestries at the north-east corner, one of which is appropriated to the choir. There is a tower at the west end of the nave, which adds considerably to the length of the church internally, and rises 140ft. from the ground line to the verge of the pinnacles. The nave is 82ft. long, divided into five bays, and is 27ft. across; the tower is 21ft. square, the aisles 13ft. 6in. wide, and the chancel 40ft. by 27ft. between the walls. The entire length is 50ft. 6in., and the width between the walls 60ft. 4in.; the height from the nave floor to the ridge is 64ft. The clerestory is arcaded both inside and out, and has a small lancet window pierced through the middle of each bay. The tower is vaulted under the ringing chamber floor, the stone arches springing from stone corbel shafts at the angles; the cells are filled in with local stone in their corners. The reredos is enriched with carvings, diaper panels, marble figures, the caps, bases, and panels, being in Derbyshire spar, and the divisional clustered shafts being in Cornish spar. The arcading on either side is in Caen stone, with Mansfield triple shafts. There are four sculptured figures in the reredos. The centre group represents the Crucifixion. The contractors were Messrs. W. & J. Milnes, Mirfield; the carving has been done throughout by Messrs. Farmer & Brindley, London; the reredos is by Mr. Earp, London.

ROWDE, WILTS.—S. Matthew's Church, Rowde, has recently been re-seated throughout with benches of Riga oak. The old peal of five bells has been recast with additional metal into six bells, by Messrs. Taylor, of Loughborough. A new north door, with oaken porch, has been added, together with a new priests' door. The ironwork for the same is the work of the local smith. The tower has been carefully restored, and the western arch, which has for many years been hidden by an organ-gallery, has now been opened, and a new organ placed at the east end of the north aisle. The west wall of the tower has been finished with a new three-light window in the same position as the old one, which had been removed and blocked up. It is filled with stained glass by Messrs. Bell & Almond, of London—the subjects being Adam and Eve in Paradise, the

Fall, Passage of the Red Sea, Manna, Sacrifice of Isaac, and the Paschal Lamb. The tracery of upper portion contains the types of the Blessed Trinity. The contractor for the woodwork was Mr. Powney, of Bromham. The whole of the stonework was carried out by local labour. The organ, peal of bells, and new seats were the gift of the late vicar, who did not live to see the result of his munificence. The whole of the works have been carried out from the designs and under the superintendence of Mr. E. Swinfen Harris, architect, of London and Stony Stratford.

S. SITHNEY.—The parish church of S. Sithney, Cornwall, was reopened on Friday week, after partial restoration. Of the works effected by the restoration, those most deserving of remark are the new east window to the chancel, the new roofs to the chancel and nave, and the tiled pavement and fittings of the chancel, which are from original designs by Mr. Sedding, the architect. The chancel roof consists of moulded principals and purlins dividing the barrel form into squares running transversely. Across these square panels are smaller ribs, and carved bosses at the intersections and further carved enrichments. The oak roof, excellent as it is, is made more effective by the addition of colour. The stonework used in the large five-light new window, and in the copings to the gables, is Polyphant stone. The restoration has been carried out by Messrs. Bone & Son, of Liskeard.

BUILDINGS.

HIGH WYCOMBE.—The foundation-stone of the Wesley Sunday Schools at High Wycombe was laid by Mr. J. S. Budgett, of London, with some ceremony on the 2nd inst. The new rooms are required to receive about 500 children, and will be light and spacious. The brickwork will be treated ornamentally, and freely exposed inside. A noteworthy fact in connection with this school is that it can claim to be the oldest in England, having a foundation dating back more than 102 years. Mr. Arthur Vernon, of High Wycombe, is the architect, and Mr. Reuben Spice, of the same place, the contractor for the works.

ROCHESTER.—On Wednesday afternoon a new Corn Exchange for the city of Rochester was formally opened. The building is an exact reproduction of the Cutlers' Hall at Sheffield, and consists of a hall, 100ft. in length by 50ft. in width. The new building was erected by Mr. Sollitt, Strood, from designs furnished by Messrs. Flockton & Abbott, architects, Sheffield.

UXBRIDGE.—New offices have been erected at Uxbridge for Messrs. Grimsdale & Sons, of Uxbridge, by Messrs. Fassnidge & Son, contractors, of the same town, from the designs and under the superintendence of Mr. Charles J. Shoppee, of Doughty-street, London, architect. It has been designed for ground floor offices only, in order to meet Messrs. Grimsdale & Sons requirements, and comprise a clerks' office, with entrance lobby facing the street, and in the rear, set back from the main building, a principal's office, lavatory, &c., &c. The materials used for the structure are red pressed Leicestershire bricks, relieved with dressings of Box Ground stone, and red Mansfield shafts to the windows and doorway. The panels under windows, string-courses, and the apex of the gable are of Pether's patent ornamental red bricks, and there is also one course of these bricks in the eaves cornice. The roofs are covered with the old plain tiles, relieved with bands of new ornamental red tiles. The ridges were manufactured by Cooper, of Maidenhead; and the eaves, gutters, and downpipes by Messrs. Walter Macfarlane & Co.

WOORURN.—A considerable addition to the national schools, Woorurn, Bucks, for the reception of 100 more scholars, has been commenced. The schools are pleasantly situated near the lately-restored church, and this enlargement will much increase their present handsome appearance in this picturesque village. The style is Early English in stone and flint; and the roof is somewhat quaintly supported by diagonal trusses dividing the interior into squares of strong and effective construction, and leaving spaces available for arch openings into old or new rooms if desired. Mr. Arthur Vernon, of Wycombe, is the architect, and Mr. W. Banghurst, of Bourne End, Bucks, contractor.

NOTTINGHAM SCHOOL OF ART.—Three students of this school have recently received appointments to Art Masterships—viz., Mr. Joseph Harris, Head Mastership of the Salisbury and Andover Government Schools of Art; Mr. J. Seddon Tyrer, the Mastership of the Art Night Class recently opened at Mansfield in connection with the Department of Science and Art; and Mr. Robert Harris, the Assistant Master in Drawing at the Manchester Grammar School.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

RECEIVED.—A. W. & Co.—G. R. G.—D. H. W.—A. S.—A. E. & Sons—E. E. R.—W. T. & Sons—W. H. G.—W. B.—L. & Son—E. L. B.—E. R.—G. E. S.—C. B.—E. M.—E. W. E.—G. H. G.

ISAAC HOBBS.—Really no room for your very long, very wandering, and very extraordinary letter.

EDWIN.—Gwilt's Dictionary, published by Longman & Co. ERRATUM.—In article on "Theory of the Arts," in the last number, p. 264, line 39, for 30° read 60°.

Correspondence.

PLANNING HOUSES.

To the Editor of the Building News.

SIR.—*Apropos* of the late design for a "Country Residence," it is remarkable how rarely one sees a well-arranged, well-lighted ground plan. Architects seem not to think of the real comfort of the prospective occupiers when planning a house. Mr. Watson's plan was altogether wrong, but it must be admitted that he sins in good company. The design by a celebrated architect in last week's BUILDING NEWS has exactly the same faults as Mr. W.'s plan. The arrangement of the apartments is inconvenient (according to ordinary notions); the position of the doors singularly awkward, the main passage imperfectly lighted (borrowed light); no gentlemen's water-closet, whilst that for servants has no external light or ventilation, and is put, in point of fact, *inside larder*! The effect of placing the smoking-room opening from entrance vestibule will be that the objectionable fumes must be wafted into and through the house. The result of putting the butler's pantry under entrance porch will be that the footmen, who generally occupy much of their time in this room, will see and overhear all that goes on at the entrance door—anything but desirable. This room has a large window, but it being under the porch will not give good light, yet it is expected to illumine, besides, the passage at the back! The stairs round the chimney back and across the window is bad; this and the cutting up windows for independent rooms, as in servants'-hall and housekeeper's rooms and the breakfast room and passage, it, it appears to me, of a slovenly makeshift character of design. One wonders why the servants' water-closet was not formed by a prolongation of the passage leading to it, by which light and ventilation would have been got from outside wall, and a lobby obtained to it. This would have made the shape of larder symmetrical, and done much to stop the smells from passing. Possibly this water-closet is intended to be lighted from the roof, but if so, it will certainly be found that more smell will enter the house than will effect escape externally. The contiguity of the larder is very strange. A common-sense improvement would be to place the smoking-room where is the morning-room, and *vice versa*. The entrance to morning-room is very bad.

Good planning is so rare that I beg to say, sir, I think if you were to invite designs for the ground plan of a villa of some such size as "Lythe Hill" (it would be good exercise for young architects—and many old ones), and publish a sheet of such, with criticism, it would be very interesting and beneficial.—I am, &c., M.

LINTELS FOR CONCRETE BUILDINGS.

SIR.—Replying to a correspondent, I beg to state lintels are not requisite for any ordinary door, window, or other openings, except where necessary for the fixing thereto of door frames or other joinery. Temporary wood bearing-pieces are, however, essential to hold up the concrete till it is set sufficiently strong to carry its own weight, and in doing this the bearer should first be thoroughly sodden with water, otherwise the wet concrete causes it gradually to swell, and thereby disturb the setting process.

I have, in many instances, had window and other openings seven feet in width clear of all support, but never knew the concrete ever to show the least signs of weakness; in fact, a concrete wall may be taken in practice to be similar to a solid stone wall without the vertical joints—great care being, of course, taken in the selection of the materials, the execution of the work, and other matters.

The Broomhall facing-blocks make substantial walls, but not more so than all concrete, and at considerably more outlay. The relative cost of walls faced with Broomhall blocks and those constructed in the usual manner with common bricks must depend largely on local circumstances, but as a rule the latter are much cheaper. The patent facing-blocks require no patent apparatus, whereas solid concrete walls cannot well be built without.—I am, &c.,

T. P.

ARCHITECTURAL EDUCATION IN GLASGOW.

SIR.—Seeing that your valuable paper is extensively circulated in Scotland in general, and Glasgow in particular, I take the liberty, through the medium of your columns, of calling the attention of the Glasgow architects to the very unsatisfactory state of architectural education, and the facilities existing for the improvement of their pupils.

When such steps are taken in other cities in the form of lectures, classes, &c., for the benefit and improvement of art students, why is it that Glasgow should be so far behind? And considering the necessity of the study of the numerous branches of the profession to be enabled to become an architect, what can be more discouraging to those ambitious for advancement in the art than want of attention paid to them by their seniors? We have a Government School of Art which we may be thankful for, so far; but what has become of the pupils' society, lectures, the use of library and rooms granted free by the Architectural Society, and why does that society cease to offer prizes for pupils' designs, as formerly; and what will become of the architects of the future if they are to be left altogether to themselves without any other assistance or means of cultivating and improving their tastes than the usual office board? Let the Institute of Architects take the matter in hand and speedily provide such facilities as will give an opportunity of acquiring such knowledge as will enable them to become useful and able members of this profession.—I am, &c.,

A GLASGOW PUPIL.

Intercommunication.

QUESTIONS.

[2342].—**Concrete Cottages.**—Will any reader who has had experience kindly inform me what thickness walls should be for two and three-storey houses, and what proportion of good Portland cement, with shingle from the beach? Also, if cobbles in the centre of the wall would be detrimental to the strength?—H.

[2343].—**Landscape Gardening.**—Will some contributor to "Intercommunication" kindly inform me where I may obtain, and the price of, a work on landscape gardening? A rudimentary treatise might be sufficient for my purpose.—RURAL.

[2344].—**Roofs.**—What kind of roof is meant by "common span or gabled roof with purlins and principal and secondary rafters"?—TECTA.

[2345].—**Door-Frames.**—What kind of door-frames are distinguished as "proper door-cases," and when are they proper?—TECTA.

[2346].—**Tendering.**—Six builders are invited by the proprietor to tender for certain buildings (the enclosed is a copy of the invitation). Each builder takes out his own quantities, and sends in a tender. The proprietor's architect calls on the lowest tenderer, and informs him of the result, and says he may proceed. Later in the same day he calls again, and countermands the order, giving as his reason that he misunderstood the proprietor. The lowest tenderer then calls on the proprietor, and is informed that the work will be given to Mr. —, the next above him, giving as his reason that he knows him. Query—Should not the lowest tenderer be compensated for the time and trouble in taking out quantities, and making his estimate, and can he legally enforce a claim against the proprietor? Also, is there any legal precedent?—Copy of memorandum.—"From E. G. to Mr. D. M.—Dear Sir,—I shall be glad if you will give me a tender for my new premises in High-street, the plans and specifications of which may be seen at Mr. K.—'s offices, Town-hall, on and after Tuesday next, 26th inst. Tenders are to be sent to Mr. K.—not later than 5 p.m. on Saturday next, 30th inst.—E. G."—A COUNTRY BUILDER.

[2347].—**Arbitration Fees.**—Two surveyors (A and B) disagree upon a valuation of standing timber, and by joint letter appoint a third (C) to decide. What is the correct or usual mode of obtaining fees for valuation undertaken and performed by C?—OAK.

[2348].—**Amiens Cathedral.**—The writer of the suggestive article on "Character in Foil Design" in last week's issue of the BUILDING NEWS would oblige by informing me if the example of cupping at Amiens referred to is that in the arcade above the porches in west front.—MAURICE B. ADAMS.

[2349].—**Percentage on Deductions.**—Exception is oftentimes taken to the charge for measuring de-

ductions from contract amounts for work not executed. Is the charge unreasonable or unfair? If the deductions exceed the extras, and no charge is allowed to be made for measuring them, is the surveyor to emulate the example of innumerable tradesmen, who ostentatiously "live by their losses"?—F.

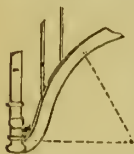
[2350].—**Brewery.**—Will any of my fellow-readers be good enough to inform me where, or in what books, I can get information as to the building and fitting up of a modern ale and porter brewery on a large scale?—**BUILDER.**

[2351].—**Wrought-Iron Girders.**—Will any contributor oblige with a formula (in arithmetic) how to calculate the strength of wrought-iron built girders?—**C. V.**

[2352].—**Surveyors' Fees.**—I have prepared plans, periodically inspected the works, and certified advances for two building speculations, the agreement stating that my charges are to be paid by the builder. I should be glad if any subscriber could tell me the proper charges to make. Eight houses in terrace worth £400 each, and a pair of semi-detached worth £1,500 the pair.—**L. H.**

REPLIES.

[2332].—**Geometrical Staircases.**—I extract the following from Newland's "Carpenter and Joiner," in answer to "Lover of Art":—"Continue the bottom line of the rail upwards until it intersects the line of the back of the last baluster, draw a horizontal line through the top of the newel, measure from that line down the back of the baluster to the intersection, and set off the same distance downwards on the under side of the rail, from which square out a line to intersect the horizontal line above; this will give the centre point of the curve."—**TECTA.**



[2333].—**Breaking-Weight of Lattice Girder.** You say the angle-iron for top and bottom flanges is $4\frac{1}{2}$ in. \times $4\frac{1}{2}$ in. \times $2\frac{1}{2}$ in.; it should be $4\frac{1}{2}$ in. \times $4\frac{1}{2}$ in. \times $2\frac{1}{2}$ in.—**G. H. THOMAS.**

WATER SUPPLY AND SANITARY MATTERS.

PURIFICATION OF THE CAM.—For some time past the Cambridge Improvement Commissioners have had under their consideration the importance of taking steps for the diversion of the sewage from the River Cam. The stream has become polluted with the sewage, and although the University have spent some thousands of pounds in its purification, the evil, owing to the sewage, still exists. The Commissioners have been urged to action; the public health has been in danger; and yet, from a want of unity as to the scheme that shall be adopted—whether by irrigation or deodorising—delay after delay has occurred. Now that the University are up, the question is again introduced, and Mr. Bailey Denton, who has been consulted, endorses the opinion given by the town surveyor (Mr. Stephenson), that the scheme of irrigation will be the best. At a committee meeting held last week, the subject was fully gone into, but no definite plan could be agreed upon. The Board has adjourned the discussion of the subject till the 31st inst., when it is hoped that some decision will be arrived at. The Board is prepared to spend £60,000 on the work.

CIRENCESTER.—Much difficulty has been experienced in obtaining a supply of water for Cirencester. The Town Commissioners having caused borings to be made on Lord Bathurst's estate, adjoining the town, and finding water in abundance, submitted it to Professor Church, of the Royal Agricultural College, for analysis. His report was satisfactory, and Mr. Taunton, C.E., has given an opinion that the Commissioners may judiciously make arrangements for obtaining aservice of 30,000 gallons a day from a well to be sunk.

BERWICK-ON-TWEED.—The new waterworks for Berwick-on-Tweed, erected at a cost of £8,000, were formally opened last week by the Mayor and Corporation.

THE DRAINAGE OF CARDIFF.—At a meeting of the Cardiff Local Board of Health, last week, the surveyor reported that the Bute Trustees had consented to a weir being thrown across the Taff, near the Great Western and South Wales railway bridge, on the other side of which a sewer could be carried to enable the new district to the west of the Taff to be drained into the Cardiff sewers. By means of the weir the whole of the new district can be drained into the old sewers at one-third of the expense of a proposed scheme to make a syphon under the river, with pumps on each side.

THE UTILISATION OF SEWAGE.—The Portsmouth Local Board have resolved to utilise their sewage; and an offer by Messrs. Russ & Minns, of London, has virtually been accepted. The following are the principal terms:—A lease of 25 years, the rent to commence on the 29th of September next. For the first five years the lessees are to pay £500 per annum; second five, £600; third five, £700; fourth five, £800; and the remaining period, £1,000. The system thus proposed to be adopted is for irrigation,

and large tracts of land a few miles from Portsmouth will be put under the system. It is also said that many thousands of acres will be now reclaimed from the sea.

STATUES, MEMORIALS, &c.

THE LATE DEAN ALFORD.—On Monday afternoon a statue of the late Dr. Alford (Dean of Canterbury) was publicly unveiled in the niche of the west front of the Cathedral at Canterbury. It has been subscribed for and erected by the Canterbury Harmonic Union, of which the late Dean was both founder and president. Dean Payne Smith and the other members of the Cathedral Chapter were present. The statue was uncovered by the Cathedral architect, Mr. Harry G. Austen.

PRESTON.—It has been resolved that the statue of the late Lord Derby, to be erected in the Miller Park, at Preston, shall consist of white marble, the previous resolution to erect the statue in bronze having given dissatisfaction in many quarters. The entire cost of the statue is estimated at £2,500.

Our Office Table.

CAMBERWELL VESTRY HALL.—The plans of competitors for the erection of the new Vestry Hall to be erected on the site of Havil House, Camberwell, were sent in on Saturday last, the 14th inst.

THE FIRE AT CHICAGO.—A correspondent of the *Scotsman* calls attention to an article in *Chambers's Journal* of 30th September last, in which the following remarks, suggesting a cause for the rapid spread of the conflagration, occur:—"Where does petroleum come from? In the neighbourhood of Chicago there are enormous deposits of oil-bearing limestone. Some of the houses there are built of it, and after a while present a smeary appearance from the exudation of the oil, &c."

A WOODEN RAILWAY.—A wooden railway, on the 4ft. 8 $\frac{1}{2}$ in. gauge, is being constructed from the town of Soré, at the confluence of the Richelieu River with the St. Lawrence, through Drummondville, to Athabaska, by Mr. L. A. Senechal, contractor. The *Montreal Herald* gives a long account of a recent inspection of the works. Upwards of two thousand men were at work, and the rails are laid on a large portion of the road. An experimental trip was made, the train going at the rate of twenty-five miles an hour, and running with remarkable smoothness. The ties, which are of hemlock and tamarac, are brought down on trucks from the woods through which the railway runs; they are put on a roll-way, run up to most ingenious circular saws, so gauged that at one operation they are mortised the proper depth and distance, not the difference of a hair's breadth being found between one and another. As fast as they are cut (and the operation is very fast indeed), the prepared ties are rolled over to a different siding from that on which they were received, an ordinary circular saw saves them, and they are loaded up to be run out to the place where they are wanted. The wedges for keying the rails are also prepared here. The rails are of maple, 4in. by 7in., and 14ft. long, the gauge of the line being 4ft. 8 $\frac{1}{2}$ in. The cost of the line, including stations (nine in number), car and locomotive depot, engine and repairing shop, engine and tender, two passenger cars, eight grain cars, and twenty-five wood cars, is 5,000 dollars per mile in full for all but the Yamaska bridge, which cost 35,000 dollars.

ASPHALTE ROADS IN PARIS.—It is stated that the authorities of Paris are about to give up the asphalt paving, and return to the old-fashioned stones, in consequence of the great expense of keeping up the former. The determination of the Parisians is not encouraging, but then it must be remembered that we are not quite so ready to use our paving-stones for the manufacture of barricades as they are.

BLASTING TIMBER WITH DYNAMITE.—Last year, at the commencement of the war, a tremendous storm inflicted much damage in the great forest of Haye (Meurthe-Moselle). The ground being weak, and the wind exerting a great force against the tops of the trees, a large number were thrown down. Recently the State has taken steps to sell these fallen trees by public auction. The stumps were taken off with the saw and the trunks were cleared and raised. The beech-roots having become very hard by a long exposure to the air, they could not be cheaply removed, and there remained on the ground a very large amount of timber. An engineer thought of applying the method that had been followed with success in similar cases in Germany; recourse was therefore had to dynamite. In each root,

and following the axis of the tree, a hole was drilled with an auger from 9in. to 15in. deep, and 3in. diameter. A dynamite cartridge, of about 50 grammes, provided with a fulminating cap and a length of ordinary mine fuse, was placed at the bottom of the hole. When the charge was tamped the explosion was made, which divided the root into quarters, after which it was easy to reduce it by ordinary means into convenient sizes. By aid of this arrangement each woodman was able to break up 2 $\frac{1}{2}$ cubic yards a day with an expense of about 3f. for dynamite, implements, and hand labour. In this manner profitable results were obtained from timber which would otherwise have been abandoned.

BUILDING MATERIALS AT THE TRIESTE EXHIBITION.—The first exhibition of arts and manufactures in Trieste is now opened. The pottery and pavement manufacture of Trieste is worthy of some attention and improvement. The puzzolano is a wonderful material for density and hardness. It can be cast into any form as walls, flooring, columns, cornices, ornaments, trusses, and articles of daily use, and can also be turned to account for engine-beds, foundations, piers, moles, baths, closets, and drain-pipes; indeed, the variety of form which can be given to this material is endless. Of brick and tile machinery there is none in the exhibition. The specimens of timber are fewer and smaller than might have been expected from the immense timber forests in possession of the Austrian Government. The building itself is temporary, constructed of wood in the form of a cross, well lighted from the upper sides; while the different annexes are placed about the grounds in convenient position.

THE EAST RIVER BRIDGE.—The caisson for the abutment of the East River Bridge on the New York side was recently towed into its final position. The caisson is oblong in shape, being 172ft. long and 102ft. wide. The main portion is 13ft. deep, and the fangs or wedges 9 $\frac{1}{2}$ ft., making the entire depth 22 $\frac{1}{2}$ ft. The planks are screwed together with huge wrought iron bolts, and the crevices are carefully caulked with oakum and pitch, so as to be completely watertight.

DEATH OF MR. W. E. WHITTINGHAM.—Mr. Walter Elliott Whittingham, the secretary and auctioneer of the British Land Company, and National Freehold Land Society, died very suddenly on Thursday week at Walthamstow. He was addressing a large gathering at a Sunday school anniversary when, leaning forward on the platform rail, he whispered "It's too much for me," and died in the arms of the friends who supported him. Mr. Whittingham was originally associated with Mr. Cobden and Mr. Joseph Hume, with Mr. Samuel Morley, M.P., Sir Joshua Walmsley, Mr. Charles Gilpin, M.P., and others, in carrying out a scheme which they had formed for extending the franchise by creating small freeholds. Gradually the objects of the society and company have become less political, but in past years the Liberal votes thus created very much changed the aspect of the Register in many districts, and provoked the establishment of the Conservative Land Society. For more than twenty years Mr. Whittingham's name has been connected with breaking up the land into building plots.

NEW LAW COURTS FOR HAMPSHIRE.—At the Hampshire quarter sessions on Monday, the magistrates decided to accept the plans of Mr. Wyatt, architect, London, for the new law courts for the county. The scheme will include the restoration of the County Hall, which is over 500 years old. The outlay will probably exceed £20,000.

THE KISTNA BRIDGE.—The bridge over the Kistna, now the only break in the railway communication between Bombay and Madras, has been making good progress. It is under the sole charge of Mr. Lindsley, who was engaged in erecting iron bridges for the Great Indian Peninsula Railway. The land piers on the Bombay side are being pushed on, and arrangements are being made for the river bed piers being laid in as soon as the fall of the river will admit of it—that is by about December. The piers are formed of great iron cylinders set side by side; they are 7ft. in diameter, and are bolted to the solid granite rock below and filled with concrete.

GLASGOW INSTITUTE OF ARCHITECTS.—The fourth annual general meeting was held on Tuesday, in the office of the Institute, 157, St. Vincent-street—Mr. Alexander Thomson in the chair. The annual report of the Council was read, and unanimously approved of. The Council for the ensuing year was appointed to consist of the following:—Messrs. Alex. Thomson, George Bell, John Baird, Campbell Douglas, David Thomson, John Gordon, John Honeyman, jun., Thomas McGuffie, Thomas Halket, and Alexander G. Thomson. The council met afterwards, when the following office-bearers were appointed:—Mr. Alexander Thomson, president; Mr.

Thomas M'Guffie, vice-president; Mr. John Baird, treasurer; Mr. Wm. M'Lean, secretary; and Mr. George Bell, auditor.

THE EXCELSIOR HYDRAULIC GOLD-WASHING COMPANY OF CALIFORNIA, LIMITED.—This company, forming under the auspices of Messrs. Chadwicks, Adamson, Collier, & Co., proposes to acquire and work a well-known auriferous tract of country in El Dorado, and to construct a canal some thirty miles long to bring water from a higher level for washing out gold deposits. The works are already in successful operation, and at a moderate calculation promise greatly-improved results. The capital of the company is £350,000 in 35,000 shares of £10 each, of which £200,000 is preference capital.

PURIFICATION OF WATER AND SEWAGE BY SPONGE IRON.—In a paper read at Leeds last week, before the National Association for the Promotion of Social Science, Professor Bischof, of the Andersonian University, Glasgow, remarked that the power of metallic iron to purify impure water had been known for a long time. By sponge iron he alluded to iron which had been produced in reverberatory furnaces by reducing an oxide without fusion. The surface was naturally greater than the surface of iron in any other form, and therefore it was to be expected that its purifying action must be proportionately increased. On the other hand, sponge iron could be made at a moderate cost, in almost unlimited quantities from burnt ores after the copper had been extracted by the so-called chlorisation process. Water which was not thoroughly bad, but of a doubtful character, might be thoroughly purified by filtering through sponge iron one foot thick at such a rate that one cubic foot of water passed through every cubic foot of sponge iron every five minutes. He asserted that sewage might by filtration through sponge iron be so purified as to exhibit all appearance of the purest drinking water. In his opinion the action of sponge iron was twofold—chemical and mechanical. To prevent a clogging of the iron it was indispensable that the filters should be so constructed as to allow a reversion of the current of water every twenty-four hours for a few minutes, and the iron being loosened by means of iron rods, any oxide formed was carried off. Any suspended impurity should be separated by filtration through sand or other known means before filtering it through sponge iron.

ARCHES COURT.—Queen Victoria-street at this time is, remarks a correspondent of the *Parochial Critic*, well worth a visit by those who may take an interest in ancient and monastic institutions. Near the old Probate House, whither, during the last two centuries, so many have anxiously flocked in search of wills, may be seen the last remains of the Court of Arches—an ancient court within which all causes spiritual arising within the parish of St. Mary-le-Bow and twelve other parishes were tried. The vaults containing the cells where the ecclesiastical offenders were imprisoned in "durance vile" may still be seen and entered, but will soon be demolished to give place to more modern structures. Immediately opposite this stands the old church of St. Benedict, built before the Fire of London. It is constructed of red brick with stone facings, and is the only church in the metropolis having a tiled roof. The business of the Court of Arches has been removed to Westminster, and that of the Probate House is soon to be temporarily removed to Somerset House, and thence to the new Law Courts when completed. The old vaults above mentioned constituted the Star Chamber.

THE TRAMWAYS.—The difficulty experienced by the tramway carriages in steering from one line to another at the points of divergence continues to cause great hindrance to the traffic, and considerable inconvenience to the public. To meet this difficulty an invention has been patented by Mr. S. W. Norman, of Lambeth, which is very simple in its application, and appears to have the advantage of being likely to effect the object in view. One of the means employed is to apply a break or block on the leading wheel, on that side of the car which corresponds with the required direction, thus steering or guiding it into the curve desired. The breaks may be so constructed that they may form either an independent system, or may be provided with suitable machinery to allow the driver to work them altogether for stopping as well as separately for steering. There are other plans included in the patent but the above is said to be at once simple and effective.

THE LAW COURTS.—It has been said that a bed of sand found on the site of the new Law Courts would reduce the expenses by some £5,000. This (the *Guardian* observes) is a mistake. The ground had been carefully examined and probed in all directions, and the exact contents of the superficial beds were accurately estimated. A few silver coins of the reign of

Elizabeth have been found, but nothing older. The great proportion of the demolished streets and lanes did not date earlier than the beginning of the seventeenth century.

Chips.

The Vestry of Lambeth have decided to support the memorial recently addressed by the Vestry of Newington to the Metropolitan Board of Works on the widening of Newington Butts.

The Birmingham School Board has resolved to apply to the Public Works Loan Commissioners for £20,000, to be expended on the building of rate-supported schools.

Mr. R. M. Phipson, F.S.A., of Norwich and Ipswich; Mr. J. H. Crown, of Norwich; and Mr. E. L. Blackburne, F.S.A., of London, have been elected surveyors for the diocese of Norwich, under the New Ecclesiastical Dilapidations Act. There were seven-teen candidates.

The Library Committee of the Corporation of London have given consent to a proposal, made by Mr. E. J. Francis, to *fac-simile* their copy of Ralph Aggas's map of London. This map is extremely rare, and the British Museum does not possess it.

The construction of a new pier at the Battery, New York, is being pushed forward rapidly. Already 12,000 square yards of mud have been taken from the bed of the river, and 10,000 square yards of stone dumped and levelled in its place.

It is stated that Messrs. Waring, Bros., the eminent contractors, have offered to widen Bristol Bridge, at a cost of £5,000, on condition that the citizens consent to their laying a tramway through the city.

On Saturday the corner-stone of a new Congregational chapel, to cost £4,000, was laid at Paddock, near Huddersfield. The style is Gothic, and the sitting accommodation is for 700 persons.

A meeting was held on Friday, at Haxell's Exeter Hotel, to get up a petition to the vestries, with the view of causing an immediate paving of the Strand with asphalt.

The quarterly meeting of the committee of the Manchester Diocesan Church Building Society was held at the Town Hall, Manchester, on Thursday, the 5th inst., the Bishop of Manchester in the chair. The following grants were made:—S. James's, Bolton, for a new church, £350; S. Luke's, Brierfield, near Burnley, for a new church, £400; Rochdale Parish Church enlargement, £45; and Atherton, for a parsonage-house, £100.

At a meeting of the Paving Committee of the Manchester Corporation, held on the 11th inst., it was resolved that the offer of the Manchester Val de Travers Paving Company to pave York-street from Mosley-street to the corner of Spring Gardens, in lieu of Cross-street, should be accepted.

A mill four stories in height, just covered in at Guiseley, completely collapsed on Sunday, the 8th inst. It was in course of erection for Mr. Deacon, of Shipley, draper.

The Bradford (Yorks) Town Council have confirmed an agreement entered into with the Peat Engineering and Sewage Filtration Company, Limited, Liverpool, for the defection of the sewage of the borough.

Miss Chafyn Grove, of Zeals House, offered to erect a drinking fountain in the Early English style, in the Market-place, Salisbury, at her own cost; but the Town Council declined it because it was not wanted, and would, if erected, cause a great waste of water!

Timber Trade Review.

PRICES, October 16.—Pensacola pitch pine planks, £12 15s. to £13 5s.; spruce battens, £7 5s. to £7 15s.; New Brunswick mixed pine, £7 5s. to £8 5s.; Quebec best floated yellow pine, £10 15s. to £11 5s.; ditto first bright, £11 15s. to £12 15s.; ditto second floated, £12 15s. to £13 15s.; ditto second bright, £13 10s.; ditto third floated, £8 15s. to £9 15s.; ditto third bright, £9 5s.; Quebec first white spruce, £9 15s. to £11; ditto seconds, £8 10s. to £9; ditto thirds, £8 to £8 5s.; St. John's white spruce, first quality, £8 15s. to £9 5s.; ditto seconds, £8 to £8 10s.; ditto thirds, £7 15s.; ditto unsorted, £8 to £8 5s.; Archangel best yellow, £12 15s. to £14 15s.; ditto seconds, £9 10s. to £10; Petersburg best yellow, £13 5s. to £13 15s.; Wyburg best yellow £10 to £10 10s.; Petersburg and Riga whitewood, £8 15s. to £9 10s.; Norway deals, other sorts, £7 5s. to £8 5s.; ditto battens, all sorts, £5 5s. to £7.

Oak timber, per load of 50 cubic feet:—Memel crown, £5 10s. to £6 15s.; ditto brack, £4 15s. to £5 5s.; Memel and Dantzic crown, £3 15s. to £4; ditto brack, £2 to £2 7s. Fir timber: Dantzic and Memel crown, £4 to £4 15s.; ditto best middling, £3 5s. to £3 15s.; good middling and second, £2 to £3 10s.; ditto common middling, £2 10s. to £2 15s.; Stettin, £2 10s. to £2 15s.; pitch pine, £3 5s. to £3 15s.

Flooring boards, per square of 1in.: First yellow, 9s. to 10s. 6d.; ditto white, 8s. 6d. to 9s. 6d.

THE LUMBER TRADE OF AMERICA.—The completion of the various railroads in Maine is adding rapidly to the value of the enormous lumber tracts in that state. Logs are now cut 250 miles from any water communication. The spruce timber of Maine is said to be equal to any that is exported from Christiania, Riga, Revel, or any other port in Europe, and the consumption is world-wide, and the demand for it constantly increasing.

Trade News.

WAGES MOVEMENT.

BOLTON.—A meeting of the house carpenters and joiners of Bolton was held on Thursday week, for the purpose of considering questions affecting the trade. It was resolved that during the eight months of summer and autumn the number of working hours should be the same as at present—viz., nine hours on Monday, ten hours each on Tuesday, Wednesday, Thursday, and Friday, and five and a half hours on Saturday; but that during the four winter months the working hours should be nine for each of the first five days of the week, and four and a half on Saturday. A motion that no overtime be worked was rejected by a large majority. It was proposed that "time and half" he paid for all overtime. An amendment was moved that "time and half" be paid up to ten o'clock, and "double time" after that hour. A rider was proposed that 9d. per hour be paid for the first four hours' overtime, and 1s. 2d. per hour afterwards. On being submitted to the meeting, one voted for the original motion and an equal number each for the amendment and rider. The chairman gave his casting vote in favour of the amendment, which was declared carried.

NEW YORK.—On the evening of September 23rd, the officers of the recent eight hour demonstration in New York city held a meeting, in which it was resolved to organise the building trades into a grand "Building League," and it was further announced that a great strike is arranged to take place next April, which will include the whole of the United States and Canada.

TENDERS.

BEDFORD.—For the erection of a new shop and premises for Mr. H. Adkin, gunsmith. Mr. John Usher, architect, Bedford:—

Carter.....	£1114
Corby.....	1091
Howe (too late).....	1070
Hull (accepted).....	1040

HACKNEY.—For the supply and delivery of 2,000 yards of the best blue Guernsey granite, for the Hackney District Board of Works:—

Fenning (accepted).....	12s. 9d. per ton.
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HACKNEY.—For the supply and delivery of 1,000 tons of broken granite, for road purposes, for the Hackney District Board of Works:—

Crook (accepted).....	11s. per ton,
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HOMERTON.—For new meat larders, coal stores, &c., at the Fever Hospital. Mr. John Walker, architect. Quantities by Mr. A. L. Buzzard:—

Builder's Work.		
Walton.....	£1628	0 0
Crabb.....	1575	0 0
Blackmore & Morley.....	1485	0 0
Nichols & Co.....	1478	0 0
Mann.....	1387	0 0
Vaughan.....	1379	0 0
Waterson & Co.....	1195	0 0
Prout.....	1195	0 0
Brown & Sons (accepted).....	1154	0 0
Robbins (withdrawn).....	866	0 0

Engineer's Work.		
Colyer & Co.....	£395	0 0
Stannah.....	280	15 0
Perrin.....	279	0 0
J. & F. May.....	274	17 0
Whitmore & Binyon.....	265	0 0
Turner & Co.....	256	13 4
Smith.....	249	0 0
Warren & Co.....	233	4 0
Jennings (accepted).....	224	0 0

LIVERPOOL.—For office and warehouse to sugar refinery for Messrs. Henry Tate & Sons, Love-lane. Mr. W. J. Mason, architect. Quantities supplied by Mr. Geo. Northcroft, surveyor:—

Tomkinson (accepted).....	£4127	0 0
Rome.....	4140	0 0
Urmsion.....	4146	0 0
Wells.....	4260	0 0
Haigh.....	4317	0 0
Nicholson & Ayre.....	4559	0 0

LONDON.—For the erection of dwelling-houses, shops, stabling, &c., Whitecross-street, St. Luke's. Mr. W. Seckham Witherington, architect, 135, Cheapside:—

Cross & Holmes.....	£2170
Elkington (accepted).....	2127

SANDY.—For the erection of new offices for E. T. L. Smith, Esq., at Sandy, Beds. Mr. John Usher, architect:—

Field.....	£279
Corby.....	274
Haynes (accepted).....	247

STOKE-ON-TRENT.—For the insertion of shop-front, and sundry additions and repairs to No. 8, Glebe-street, for Mr. W. Moody. Mr. Edwin Penn, architect:—

Millin & Davies.....	£185	0 0
Ogden.....	180	0 0
Bradbury.....	173	11 6
Pope.....	135	0 0
Barlow (accepted).....	134	0 0

STOKE-ON-TRENT.—For alterations and additions to No. 7, Glebe-street, for Mr. R. Shuffelbotham. Mr. E. Iwin Penn, architect:—

Millin & Davies.....	£114	0 0
Ogden.....	112	0 0
Bradbury.....	107	0 0
Pope.....	98	0 0
Barlow (accepted).....	95	0 0

CONTRACTS OPEN FOR BUILDING ESTIMATES.

WALTHAMSTOW, Nov. 3.—For the enclosure of their new burial ground, by oak park pale fencing, about 5ft. 6in. high.—William Houghton, Clerk to the said Board, 15a, S. Helen's-place, Bishopsgate-street, London.

LEEDS, Oct. 26.—For the erection of a police station at Kirkstall, in the township of Headingley-cum-Burley.—C. A. Curwood, Town Clerk, Leeds.

LEEDS, Oct. 25.—For the bricklayers' and joiners' work of two houses, Woodsley-road.—James Charles, architect, Infirmary-street.

IRELAND, Oct. 30.—For erecting and completing a new barracks for the Royal Irish Constabulary at Rochfort-bridge, County Westmeath.—Mr. Edward Hornby, Secretary, Office of Public Works, Dublin.

JERSEY, Nov. 1.—For the construction of a line of railway from S. Helier's to Gorey, in the Isle of Jersey, about six miles in length.—Information from Mr. John Wimble, Secretary, Jersey Eastern Railway Company, Jersey.

GORTON, Oct. 26.—For sewerage, flagging, channelling, and completing certain passages within the district of Gorton.—Peter Hindle, Clerk to the Board, Local Board Offices, Hyde-road, Gorton.

HAVANT, Oct. 30.—For the erection of national schools.—Architect, Mr. J. W. Pinfold, No. 17, Parliament-street, Westminster.

CONGRESBURG SCHOOLS, October 28.—For additional or amended tenders for the erection of these schools.—Rev. W. Hunt, the Vicarage, Congressburg, Bristol.

ALTRINCHAM UNION, October 25.—For additions and alterations to the workhouse at Knutsford.—John B. Cutter, clerk to the Guardians, Union Offices, Knutsford.

EASTBOURNE, October 25.—For the erection of a villa residence and stabling.—R. K. Blessley, Architect, Westbourne-villa, Eastbourne.

WYMONDHAM CHARITY, November 6.—For repairs and alterations to the Chapel of S. Thomas A'Becket.—Mr. E. J. Howlett, Solicitor, Wymondham, Norfolk.

SALISBURY, October 25.—For providing and fixing the ironwork required in adding a footway, 6ft. wide, and 140ft. long, to the north side of Fisherton-bridge, and a railway, 60ft. long, on the south side.—Charles Marsh Lee, Town Clerk, Salisbury.

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Do. do. 12 by 7 ...	1 18 6 ... 13s.
Do. do. 12 by 6 ...	1 7 6 ... 11s.

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Specimens at Museum of Geology, Jermyn-street, Piccadilly, W., and at Architectural Museum, Tufon-street, Westminster.

BANKRUPTS.

TO SURRENDER IN LONDON.

Jean Nadal, Newman-street, Oxford-street, hydraulic engineer, October 23, at 12.

TO SURRENDER IN THE COUNTRY.

Thomas Chapman and Joseph Shaw, Halifax, contractors, October 27, at 10.

PUBLIC EXAMINATION.

November 23, J. J. Bell and H. Harris, Hanover-street, Pimlico, builders.

DECLARATION OF DIVIDEND.

W. Harvey, Plymouth, builder, div. 1s. 1½d.

DIVIDEND MEETINGS.

November 10, J. Farmer, Ironbridge, builder and cement manufacturer.—October 23, W. W. Martin, Exeter, engineer.

PARTNERSHIPS DISSOLVED.

J. W. Winstanley and M. M. Holloway, as executors of the late W. Strobe, and E. P. Williams and J. McKenzie, Osnaburg-street, and elsewhere, gas engineers.—D. Nicholl, H. Earnshaw, and W. H. Dean, Halifax, stone merchants.—E. W. Straker and R. Burke, Brown's-buildings, St. Mary-axe, painters.—E. Hoyes and G. Hoyes, Nottingham, builders.—Thomas and Williams, Ardill, engineers.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

LEAD.			
Pig—Foreign	per ton	£17 10 0	£18 5 0
" English W.B.	do	20 5 0	20 10 0
" Lead Co.	do	18 10 0	18 15 0
" Other brands	do	18 0 0	18 5 0
Sheet Milled	do	18 5 0	19 0 0
Shot, Patent	do	20 10 0	21 0 0
Red or minium	do	20 10 0	21 0 0
Litharge, W.B.	do	0 0 0	0 0 0
White Dry	do	25 10 0	26 0 0
" ground in oil	do	0 0 0	0 0 0

COPPER.			
British—Cafe & Ingot	per ton	£71 0 0	£76 0 0
Best Selected	do	77 0 0	78 0 0
Sheet	do	77 0 0	81 0 0
Bottoms	do	81 0 0	83 0 0
Australian	do	75 0 0	78 0 0
Spanish Cake	do	63 0 0	70 0 0
Chill Bars, cash	do	57 0 0	69 0 0
" Refined ingot	do	75 0 0	0 0 0
Yellow Metal	per lb.	0 0 6½	0 0 7½

IRON.			
Pig in Scotland, cash	per ton	£3 1 0	£0 0 0
Welsh Bar, in London	do	7 17 6	8 10 0
Staffordshire	do	9 0 0	9 5 0
Irish, in Wales	do	6 15 0	7 0 0
Sheets, single in London	do	10 10 0	11 5 0
Hoops, first quality	do	10 0 0	10 10 0
Nail Rod	do	8 17 6	9 5 0
Swedish	do	10 5 0	11 0 0

OILS, &c.			
Seal, pale	per tun	33 10 0	0 0 0
Sperm body	do	80 0 0	81 0 0
Cod	do	33 10 0	33 10 0
Whale, South Sea, pale	do	32 10 0	0 0 0
Olive, Gallipoli	do	51 0 0	0 0 0
Cocoon, Cochin, tun	do	52 0 0	0 0 0
Palm, fine	do	37 0 0	0 0 0
Linseed	do	34 0 0	0 0 0
Rapeseed, Eng. pale	do	47 0 0	0 0 0
Cottonseed	do	33 10 0	0 0 0

TIMBER.			
Teak	load	12 5 0	13 10 0
Quebec, red pine	do	3 15 0	4 15 0
" yellow pine	do	4 5 0	5 5 0
Quebec oak, white	do	6 0 0	6 5 0
" birch	do	3 15 0	5 0 0
" elm	do	3 10 0	4 0 0
Dantzic oak	do	4 10 0	6 10 0
" fir	do	2 7 0	4 0 0
Memel fir	do	3 0 0	3 5 0
Riga	do	3 0 0	3 10 0
Swedish	do	2 0 0	2 10 0
Masts, Quebec red pine	do	4 0 0	6 10 0
" yellow pine	do	4 0 0	6 10 0
Oregon	do	7 0 0	10 0 0
Lathwood, Dantzic, fm.	do	3 0 0	4 10 0
St. Petersburg	do	5 10 0	6 15 0
Deals, per C, 12ft. by 3 by 9in.	do	12 0 0	18 0 0
Quebec, white spruce	do	12 0 0	14 0 0
St. John, white spruce	do	12 0 0	14 0 0
Yellow pine, pr reduced C	do	18 10 0	20 0 0
Canada, 1st quality	do	13 0 0	14 10 0
2nd do	do	12 10 0	14 10 0
Archangel, yellow	do	12 10 0	13 10 0
St. Petersburg, yellow	do	6 15 0	7 15 0
Finland	do	0 0 0	0 0 0
Memel and Dantzic	do	8 10 0	10 10 0
Gothenburg, yellow	do	8 0 0	9 0 0
white	do	10 10 0	12 10 0
Gefle, yellow	do	8 10 0	12 0 0
Soderham	do	8 10 0	12 0 0
Christiania, per C, 12ft. by 3 by 9in., yellow	do	10 0 0	12 10 0
Other Norway	do	7 0 0	8 0 0
Flooring boards, pr square of lin, first yellow	do	0 9 0	0 10 0
First white	do	0 5 0	0 9 0
Second qualities	do	0 6 0	0 8 0

BREAKFAST.—EPPS'S COCOA.—GRATEFUL AND COMFORTING.—By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills.—"Civil Service Gazette." Made simply with Boiling Water or Milk. Each packet is labelled—"JAMES EPPS & CO., Homoeopathic Chemists, London." Also, makers of Epps's Milky Cocoa (Cocoa and Condensed Milk).

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Being a Review of the Defects of existing Houses, and containing Registered Designs by the Author for Model Houses from which Buildings have been erected; together with Registered Plans for the Adaptation of existing Dwelling-houses for Letting in Flats.

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THE BUILDING NEWS.

LONDON, FRIDAY, OCT. 27, 1871.

THE RESTORATION OF SCULPTURE.

THERE was until lately in the foremost museum of Europe, the Vatican excepted, a figure in marble, the glory of a splendid hall, in the centre of which it stood, enthroned on a lonely pedestal, incomparable. It was known as the Venus of Milo, and, in the art-world of Paris, concentrated in the Louvre, was held to be a treasure priceless and inimitable. Among the innumerable charms which connoisseurs were for ever discovering in it was a certain sideway bend in the contour, which certainly was of exceeding grace, and great were the praises of the sculptor. But when the fierce convulsions of France broke forth, and her capital was threatened with ruin and pillage, the guardians of those rich galleries lifted the marble beauty from her eminence, laid her in a wooden case, and concealed her in a cellar, until the tempest should have passed away. It was then discovered that the image was constructed, not of one piece, but two, fitted together by a sort of iron spine, and learned people have ever since been seriously doubting whether the artist ever thought of the fascinating "Grecian bend" at all, but whether, the statue having been broken, unless it was not originally moulded in two parts, its attitude had not changed, thus happily, in the process of restoration. All we can say is that we wish our modern restorations were equally fortunate, since as it is they are rarely better than triumphs of disfigurement, worse than the mutilations they are supposed to remedy. Better a Venus de Medici with one hand gone, or Clyte with a ringlet struck from her head, than that these gems should be manipulated, as other gems have been, by the clumsy hands of men to whom art is little better than a trade, a stonemason's craft, a kind of mortuary knack. Rarely, if ever, is the effect satisfactory, or even not repulsive. Legs, arms, fingers, noses, chins, cheeks, and brows, with other parts calling for the sweetest outlines, are replaced without any of the spirit of the early sculptor, and may instantly, notwithstanding all disguises, be detected. Nor is this entirely the restorer's fault. It seems impossible to reproduce the tint and mellowness of the ancient marble, which grew uniformly as ages went on, any more than to emulate the perfection of form which the Greeks gave to their sculpture. For example, who would dare to carve a body for the Roman head, or limbs, arms, and a head for the superb torso which the Duke de Luynes, a few years ago, presented to the French Emperor? They would necessarily be the work of totally different schools, bearing the stamp of far-divided ages, and imbued with an utterly changed spirit. We question whether Michael Angelo could have succeeded in completing a fragment of Phidias, and we know that Flaxman would have refused to attempt restoring a work from Michael Angelo's chisel. There can, of course, be no originality, no idealism, no character, but only guess-work, mathematical copying, with inferior materials and inferior talent, in a restoration; and, therefore, since it must be conceded and it cannot be denied that a thousand tender touches may be wanting, our belief in the masterpiece may remain; but its subtleties are gone, its influences are disturbed by the presence, as it were, of a rude and coarse intrusion. All great artists have secrets, which they illustrate by the productions of their hands; these, when a head or limb is lost, are lost also. We cannot bring back the expression of them, any more than we could obtain a Torso Belvedere, or Venus Anadyomene, from one of the New-road or Kensal-green Cemetery sculptors. We might as well challenge a comparison between the

grand antique collections of Europe, and the myriad Nymphs, Musidoras, Eves, Unas, Godivas, and bathing groups, polished with curd soap, or treated with strong acids, to improve the colour and gloss of nineteenth-century exhibitions. Our generation does not want to express what the Greeks wanted to express. With them it was part of a religion; with us it is a part of our manners. We are dealing more with general principles upon this subject than with particular instances; but, in illustration, it may be asked upon what principle is the work of restoration carried on at the British Museum? Why is the first gallery absolutely a collection of heads, arms, legs, feet, and hands, presumptuously added to ancient sculpture, when in other greater galleries the most splendid relics of antiquity are respected? Why are Ceres, Diana, and Venus maltreated in one place, while they are held sacred in another? We do not find this barbarous patchwork going on among the Lycian marbles, although they number some of the noblest and yet most mutilated groups in existence. The sculptures from the pediment of the Parthenon have not been touched; they include the headless Niobid group, and the struggle of Theseus with Artemis; nor has the splendid Apollo from the Coffer collection; nor the exquisite torso of a girl from the temple of Rhammes; nor that of a woman from the Isle of Claudus; nor the celebrated Persian equestrian figure; the Apollo Cithæroedus; nor that airy Nereid, armless, and with an amputated leg; nor the two groups of young carrying girls, that seem alive, and suggest themselves in their entirety far better than any restoration could suggest, although they are the merest fragments. Let us hope that no arrogant and pedant hands will ever be laid upon them, but that they may be exemplars of the highest art that ever bloomed upon this earth for the delight of all generations.

Some years ago there was held at Paris a conference of painters on a kindred question—that of picture restorations. For a long period previously there had been a rage for this victimising process. The directors of the Louvre undertook to brighten up and revivify the half-perished treasures of private individuals, whose property often came home to them utterly ruined. The destruction thus wrought can never be estimated. For instance, the Monks of La Trappe obtained from the Administration a promise to restore the portrait of the Abbe Rance, the famous reformer of Cîteaux, painted by Rigaud from memory. On the back of the picture was written its very peculiar history. This the restorers immediately covered over with another canvas; the mistake was discovered; the canvas was taken off; but the inscription had been obliterated, and the work had lost nearly all its value. Nine professional restorers were not long ago employed at the Louvre repairing and varnishing the pictures, and at Versailles these gentlemen were ordered to shorten or lengthen pictures, in order that they might fit particular panels in the walls. Thus, and by similar methods, a rich cabinet of art-work was shamefully and irretrievably damaged, for even restoration could not pretend to do anything here. Thus Sebastian del Piombo's "Virgin Going to Visit S. Elizabeth" was for months in the dark laboratory of the Louvre—the only work of that master in the collection, except his fine portrait of the wicked Bandinelli, and it emerged worn down, violated, and destroyed. Next Rubens' "Virgin and Angels" went up with all the glow of his genius upon it; it came down "like a fine fruit crushed between the fingers, and strained by the roughest contact." Works of painting, indeed, often restore themselves—beautify themselves indeed, being subject to transformations brought about by time, and owing to different circumstances and causes exceedingly difficult to appreciate. Oils and varnishes alter

in numerous ways; the subjectiles, moreover, on which oils are placed exercise various influences; and it is, most frequently, a pernicious habit to attempt counteracting them; the process is a natural and rarely a mischievous one. Thus are brought out the last and most subtle qualities, the intangible delicacies which, with all the hateful jargon which artists have at their command, cannot be described, the final touches of the magicians in light and colour constituting a masterpiece which vanish under the hand of the restorer. It is the same, or nearly the same, with sculpture. We lose nothing away, it is true, but we deface the beauty of the work, disturb the eye, destroy the harmony of it by vulgar additions. Who would give a single real antique for all the modern heads, busts, legs, arms, hands, feet, or toes in the British Museum? The French are not quite such savages in this respect. Among their collection of primitive sculpture they have never touched the imperfections caused by accident and time; they set a high value on torsos, and have not even reunited the fragments of the Olympian figures because it would necessitate a slight intrusion of their own inferior handiwork. The wisest principle would be, perhaps, if it be thought essential to realise a full idea of the broken image or group, to reproduce it in a copy, and set this by the side of the original, a method by which the imagination might be assisted. Perhaps an illustration of what we mean is the beautiful group of the child and the goose. For the most part it is ancient; but the head is new, and a coarse, inert, lifeless, and expressionless head it is. Then there is the celebrated statue of Cincinnatus, all vitality, all movement, but the arms are awkward, or not in harmony with the body, though they have been attributed to Michael Angelo; they are heavy, and modelled in a style of disagreeable exaggeration. Better have left the noble figure alone; for, plainly speaking, the restorer, whoever he might have been, spoiled it. Indeed, it may be doubted whether a good deal of decapitation and amputation might not be undertaken in our galleries of ancient sculpture with admirable effect; a "restoration" in a different sense, giving back to us the footless Venus, the armless Diana, the headless Psyche, who, were it not for that nineteenth-century head, would appear about to float from her pedestal, wingless though she be. At any rate, we trust that the growing good taste of the time, encouraged by so many ambitious schools of art, will, before long, on the Continent as in England, put at least a check upon these restorations, which virtually are mutilations, and these sophistications, by which our collections, with their once inimitable treasures, have been depraved. We have referred, however, to an example in which a restoration, if it was a restoration, is reputed to have added a beauty to a renowned masterpiece of sculpture, the Venus of Milo, unquestionably the finest work of its class existing—queen in the realm of marble art, so powerful and lofty, and even adorable, as it was left to us at its culminating point by the ancients, and yet from the hand of an artist whose name has perished. The beauty of the face is of the happiest kind, but that, and the attitude of the form it is which has been the subject of a recent and unexpected controversy. This will best be understood if we quote the brief but exact description given by M. Henri Lavois: "The goddess maintains," he says, "by a movement of the thigh and hip, slightly raised, the drapery by which she is half veiled; from the origin of the shoulder the right arm curves outward; and the hand, by a graceful movement, is raised to the hair, to which it gives the last arrangement; the left arm descends, slightly pressing on the bosom, but its forepart rises and holds a mirror; the body is bent slightly backwards, the head is raised, and the eyes are fixed on the object that attracts them. It is Venus

contemplating the splendour of her own divine charms, and smiling in pride at her unrivalled beauty." Such, at least, is the account of a smaller statue, believed to have been the original of this one, and by no means a copy from it. The point is whether that bend was intended by the artist, or fortuitously given to the figure when reconstructed.

If so, we admit that the grace of the statue may have been increased. Still, it was not done in our time. But, for the most part, these restorations are of use only to ignorant and superficial visitors who gape about museums, and are incapable of perceiving beauty in a legless Hebe. Even the Venus of Arles has been desecrated by having a fresh arm bestowed upon it, drying up, as it were, the sources of inspiration in the admirer's mind. His eye is attracted by the restoration as by a blot on a snowy surface. So with that nameless recumbent goddess lately in the Louvre, which is literally beneath disfigurement, and in the restoration of which the artists employed were positively not satisfied with adding, but also took away, sawing off fragments in order to connect the broken parts, as if an atom could be spared from those precious and speaking relics of the most refined and sparkling civilisation that mankind ever saw, thus producing "an ugly even surface," as it has been boldly called; boring deep holes—which seems a cruelty to these tender works of the artist's love—and introducing iron hold-fasts, so that, if ever the restorations were taken away, the effect would be lamentable. But by this device the barbarians chained their own awkwardnesses to the grace they were disfiguring literally by fetters of iron. We wonder whether the saw is ever employed at the British Museum as it was once at the Louvre. To a larger category belong a multitude of restored bulls, horses, lions, hounds, stags, and mythical creatures, among the latest of which is a colossal lion, concerning which nothing less can be said than that it has been made hopelessly hideous. Why have touched it? Or, why not have touched the hundreds of figures which have been allowed to continue in their majestic fragmentary state, exactly as when they were dug out of vast city ruins, old-world tombs, and the sand-depths of the desert? If the restorers must have employment for their ingenuity, let them keep among the antediluvian mammoth bones, with which they can do little harm, except that their reproductions are likely to delude. But, in the name of art, let them keep their profaning hands from the wondrous sculptures of antiquity, which they can only touch to profane.

THE NEW LAW COURTS.—III.

(Continued from page 286.)

THE CENTRAL HALL.

WHILE the old association between Westminster and the Courts of Law may continue to be indirectly maintained by the presence of a noble hall in the midst of the actual courts in the new building, when regarded from an architectural point of view the resemblance between Mr. Street's Central Hall and the famous old hall at Westminster is seen to be very slight indeed; in truth, all that is common to the two edifices is the fact that each one is a hall, and that both are fine and characteristic expressions of Gothic architecture.

With the exception of its south end, which forms a part of the grand front of the entire building, and constitutes the central culminating point of the composition in that front, the exterior of the Central Hall is comparatively closed in by the surrounding parts of the building, its north end rising above such parts as abut upon it, and its sides being left clear—absolutely clear, indeed, above the string of the window-sills—by wide open light-spaces provided in part for that par-

ticular purpose. The exterior elevations—that in the Strand front excepted—accordingly, are severely simple; and yet their simplicity is eminently dignified, and throughout characterised by true artistic feeling. At each of the two southern angles is a large tower-like octagonal stair-turret, showing much originality of treatment, of which the finials rise 155ft. above the Strand level (the ball beneath the vane of the quasi-spire of St. Clement's Church is 156ft.). Plain from the basement mouldings upwards to the string immediately below the window-sills, the side-walls will be built of red bricks (the bricks of fine clay and peculiar proportions, giving five courses to the foot) with stone dressings. The bays, nine in number, are divided by buttresses of bold projection, which at the parapet are crowned by acute-angled headings, quite plain. The low buildings which abut upon the side walls of the hall cover only 129ft. 6in. on each side; and thus, since the exterior length of the walls is 343ft. 8in., on each side the walls rise perfectly open and free from their plinths upwards throughout 214ft. 2in. of their length. The space between each pair of buttresses is filled by one of the windows, except in the sixth bay, where on each side of the hall there is a stair-tower with flanking buttresses and air-shafts, in general character corresponding with the southern angle-towers, but considerably larger. From these twin towers are carried up, spanning the roof, the great arch-buttresses that perform a most important part in supporting the lantern and its crowning fleche. The finial of this fleche, which combines richness of detail with the utmost boldness in each of its stages and in all its leading features, is 193ft., being 60ft. above the crested ridge of the roof. By means of a central spiral flight of stairs from a gallery not far above the ridge of the roof, provision is made for access to a small upper gallery, a little below the finial, from whence may be obtained a remarkable bird's-eye view of the whole range of the buildings. The parapet of the side walls, formed of two rows of corbels with corresponding courses of weathering, is bold, plain, and effective. The north end, quite plain except its finial, is clear above the line of the side window sills; below the vaulting it is pierced with three distinct large lancet-windows perfectly plain, and above them in the gable—which shows to advantage over the sky-line of the Carey-street front—are three other lancets, cusped, with a trefoil roof-window higher still. At the two angles are buttresses, projecting 10ft. and set at right angles to the walls and to each other, which are gabled at the parapet level, and at that point from them there rise two bold corbelled tourelles, with plain conical caps and finials. The exterior aspect of the hall at its south end will be most appropriately considered with the Strand front.

As seen from the interior, the south end of the hall has a very striking effect. Through the main triple entrance-archway the prolonged perspective of the inner and outer vestibules first attracts attention. The eye then rises to the gallery, with its flights of steps adjusted to the lesser height of the two lateral arches, and leading west and east to the bar-corridor. On the face of the wall beyond the gallery is an arcade of three arches corresponding with the entrance-archway below, the central arch being crowned with a plain rectilinear caupy rising above the sill of the central light of the south window. This south window is a group of five lancets, graduated in height, the central lancet being considerably more lofty than the two exterior lancets; or this fine window may be accurately described as a central three-light between two lateral single-lights, all the lights being lancets, and the whole being combined by a series of richly-shafted mullions to form a single window-composition beneath one great window-

arch; this arch has two orders of enriched arch-mouldings, shafted jambs, and an enriched hood-moulding, with beautiful corbels. At its head each of these five lancets has five-foil cusping, the uppermost foil acutely pointed, and the other foils rounded, all the cusps being sharp, and having a bold projection. A tall pointed pierced quatrefoil, within an elongated oval, also pointed, and with an eye, appears on each side of the head of the central lancet, but there is no other indication or suggestion of tracery. Within the great window-arch the central group of three lancets has a distinct hood-moulding, and so also has each of the lateral lancets. Immediately below this window, which at once contrasts and harmonises well with the great uncusped triplet at the other end of the hall, is a horizontal belt of sculptured work, 35ft. above the level of the pavement. At the northern end of the hall, as at the southern end, there is a gallery in the centre; but this northern gallery, which is carried by two arches and as many half arches, does not surmount any doorway, the northern end of the hall being closed to prevent a thoroughfare. From this northern gallery a double archway leads still farther northwards at the level of the court-floor. The three very large lancet windows, without any cusping, which light the northern end of the hall on the interior, are grouped together by shafted jambs and by continuous arch-mouldings with a band of nail-head. A rich string below the window-sills is 38ft. 6in. from the pavement.

The width of the hall, 48ft. (not 43ft.), effectually preserves it from any appearance of undue length, and with a height of 79ft. 6in. (not 75ft.) gives to the interior proportions that are well balanced and dignified. The interior length is 230ft. (the extreme exterior length is 258ft. 8in.)—a length absolutely necessary to enable the hall to fulfil its appointed duties; this length with the width of 48ft. gives nearly five squares of the superficial area. The treatment of the sides of this great hall demands unqualified admiration. Commencing from the south, on each side in the second, fourth, fifth, sixth, and eighth of the nine bays, beneath a sculptured string 13ft. from the pavement is a wall-arcade of five pointed arches with trefoil cusping, each group of their clustered shafts having one detached shaft between two that are engaged; in the central arch of the fifth bay also there is a doorway. The string is continued for a short space in each of the first, third, seventh, and ninth bays over a narrow acutely-pointed wall-arch with five-foil cusping; and then the string rises to form a large and lofty arch, beneath which is a double doorway-arch leading to the flights of stairs in communication with the courts and with the other parts of the building. While they interrupt the continuity of the wall-arcade these double archways are in perfect harmony with it. The same archways in the northernmost bays have a special communication with the corridors that lead to external entrances in the west and north fronts, and on the east from the quadrangle. Above the archways and the string of the wall arcade the walls are plain until, at 31ft. 6in. above the pavement occurs the belt of sculpture at the foot of the range of window sills, of which the continuity is interrupted only by the clustered shafts, corresponding in position with the buttresses of which they may be said to form the inner faces, that divide the bays and carry the main arches of the vaulting. The abaci of the capitals of these vaulting-shafts are 48ft. above the pavement, while those of the shafts, also clustered, of the window-jambs rise 13ft. higher. Each bay, except the sixth from the south, is filled by one of the range of eight windows that light the hall on each side. Under a single arch each of these windows has two tall trefoiled lights, surmounted by a circle having eight-foil cusping, the cusps cut off square. The

extreme width of each window from the exterior of the jambs is 21ft. 6in., the height of the window-arches is 4ft., and the lights have a clear height of 31ft. In place of windows, the sixth bay is occupied by the three clusters of shafts, each cluster carried by corbels rising from canopied niches, which support the great triple arch of the lantern. The vaulting throughout the hall is of the simplest order; transverse arches divide the bays, and in each bay two diagonal ribs intersect each other. Here we may observe that the open spaces for light, five in number, which range along each side of the hall, are upwards of 26ft. in width; also that the comparatively narrow strips of building that divide these light spaces rise to no great height; consequently, there is abundance of light for the hall, and there are ample means for seeing its exterior. And these remarks lead on to another, to the effect that each one of the ten open light spaces which encompass the Central Hall, as it has the hall itself on one side of it, on the opposite side has another part of the building; again, each of the eighteen courts has an elevation for each of the two sides that contain its ranges of windows; also, there are ten elevations for the polygonal and semi-circular towers that contain the witnesses' flights of stairs, and the corresponding ten elevations of the parts of the building opposite to them; so that, not to particularise certain other lesser elevations, upon every one of which thought and care and labour have been unsparingly bestowed, in addition to the eight great elevations already specified, and which comprehend the main fronts of the building, not less than forty-eight other elevations are to be included in Mr. Street's designs; and yet we feel tolerably sure that not one of the critics who were so ready to condemn Mr. Street's "design" ever even dreamt of their existence.

THE WEST, OR CLEMENT'S INN FRONT.

Possessing many features common to the other principal fronts with itself, this west front, like the others, has its own distinctive characteristics, and in itself, also, it is no less original and no less complete as a composition than it would have been had none of the other fronts been in existence. It will be kept in remembrance, as a quality common to all the four main fronts, that their average height is about 100ft., and their average length about 500ft. The height of Messrs. Twinings' bank, one of the loftiest buildings on the opposite side of the Strand, is 57ft. 10in. The line of the face of this front is broken only by parts of the building which have a slight projection, and are few in number. These projecting parts (which also break the sky-line) are, first, the staircase tower, near the north-end, 30ft. wide, a work of great dignity and beauty, rising high above the parapet, the two-light windows ascending with the ascent of the stairs within and the strings accompanying them; the uppermost windows are canopied, and the tall pointed roof is supported by a richly-corbelled parapet; in this tower there is an entrance-doorway; second, the central tower, 40ft. wide, with the rich oriels of the rooms for the Admiralty and Bankruptcy Judges, and other windows below and above them; the roof lofty, with rich cresting and vane, flanked by a chimney toward the south; and third, the Judges' entrance-tower, 35ft. wide, with a square-headed doorway under a lofty arch, surmounted by three two-light windows transomed, the whole crowned by a very richly corbelled parapet and lofty roof, with rich cresting and finials. Besides these three towers, there are two projections containing the officers' entrances and stairs, with two two-light windows, and two groups of three-lights, which do not rise to the parapet. Also, near to south-end, the Vice Chancellors' beautiful octagonal entrance and stair turret, with its four two-light windows, has its pointed roof springing from its own corbelled parapet a little below the line of

the main parapet of the building. The difference of level between Carey-street and the Strand, which causes the west front at first to appear as a building of four stories only, is adjusted by flights of steps descending south-wards from the north end. In addition to the two oriels already mentioned, in this front there are the oriels of the Lord Chancellor, the Lords Justices, the Divorce Judge, and two of the Barons of the Exchequer. There also is a large double-arched entrance near the northernmost tower, opening to the corridor which leads through the main building to the quadrangle; and a low and wide doorway in the central tower leading to the basement. The windows in the basement, and in the first story above, with the exception of a solitary three-light in each story, are plain and single, with square or very slightly rounded heads. In the court-floor the ranges of windows are under pointed relieving arches, the openings being flat. In the upper two stories the windows are grouped together, either as single windows or as pairs, the window arches of the uppermost range being continued as a wall-arcade; the capitals also have their enrichment carried on to form a continuous belt of carved work; in the towers the uniformity of these upper ranges of windows is somewhat modified. At the north-west angle is a corbelled tourelle, the corbel shafted; the arrangement at the south-west angle awaits a final decision. The roofs, of a high pitch, have a ridge-cresting, and from them there rise thirteen chimneys. It may be added that in this front there are upwards of 320ft. in which the wall has a uniform face; that the sky-line of the main range of building, broken only by three towers, has two levels only; that of the 180 (or thereabouts) windows, 140 have the lights quite plain, open, and with square heads, while in seventeen windows only—all of them judges' oriels or staircase windows—is there any approach even to the simplest tracery. The balance of parts in this front, and their distribution, leave nothing to be desired.

THE NORTH, OR CAREY STREET FRONT.

Notwithstanding the disadvantage incidental to the higher level of Carey-street, which reduces the height of this front by 17ft. and deprives it of its basement-story (here below the street level), the north front is one of the most pleasing and impressive, as it is one of the most perfect of Mr. Street's compositions for the New Law Courts. While the whole range of building towards Carey-street forms a single united and harmonious front, in part distinguished by the strictest uniformity and in part exhibiting the most decided variety, in reality this front consists of three distinct fronts—the north front, that is, of the main block, the exterior north front of the quadrangle, and the north front of that eastern range of building which closes in the quadrangle towards the east. Of these three fronts, the first, the north front of the main block, divides itself into five compartments. The central compartment, in length 120ft., has in its own centre the bar-entrance, a spacious square-headed doorway under a single lofty pointed arch, the arch-head pierced with lights and canopied. To the west of this entrance are two pairs of two-light windows under lofty arches, succeeded by two groups of three-lights, one group above the other; these windows are balanced on the other side of the doorway by a range of five large single-light windows, the lights with trefoil cusping under continuous window arches—this range lights the northern bar-room. Above, extending along the whole of this compartment and rising to the enriched cornice below the parapet, there is a range of five large two-light windows to the bar-library or principal consultation-room; the lights have trefoil cusping, and in the head of each richly-canopied arch is a circle pierced with a quatrefoil; the window-arches themselves are connected by a wall-arcade of

pairs of acutely-pointed cusped arches, each pair being surmounted by a circular panel with eight-foil cusping, containing an armorial shield on a diapered field; the ceiling of this noble room is panelled with arched principals. The crested roof of this central compartment, flanked by chimneys, rises above the level of the roofs on either side of it. Over the centre the north gables and tourelles of the Central Hall are visible, and lead up well to a culminating-point. Each of the compartments which adjoin the central compartment to the west and east contains a public entrance; a judges' bay window, of two lights; a single-light window trefoiled; and two ranges of five windows in each, the lower range plain, with square heads, the upper range having pointed arches alternately with five-foil and trefoil cusping. Above, a rich cornice supports a plain parapet, and the roof has a dormer and a chimney. Again, this front of the main block is completed to its west and east angles by another compartment, flanked on each side by a shafted and corbelled tourelle, and containing a judge's entrance, the canopy of the archway enriched with pinnacles, crockets, and a finial; one plain window, and two upper ranges of windows corresponding with those in the adjoining compartments. The roof has two dormers, and a single massive chimney.

Set back 40 feet from the line of the front of the main block, the Carey-street front of the quadrangle comprises an entrance tower, and a gabled range of building to the east of it. In the tower, which has a roof of a very high pitch, crested, and flanked by a tall chimney towards the east, the double entrance-archway is surmounted by a group of richly corbelled and canopied niches, between two tiers of cusped two-light windows, three in each tier; and above the niches is a large transomed window of two cusped lights, under a very rich and lofty canopy, which rises above the corbelled parapet of the tower. The adjoining compartment, with a plain gable containing three windows above a belt of quatrefoil-panels, has seventeen single-light windows, the arches pointed and cusped. The roof-cresting is very rich, and there is one chimney. More to the east, and advanced again to the line of the main block, is the north-east tower, rising 135 feet above the Carey-street level, with an octagonal stair-turret, and a lofty chimney; it has five tiers of windows, with intervening belts of sculpture, and in the head of the uppermost window-arch is a statue of Justice. The parapet is richly corbelled, and the very lofty crested roof has a dormer and finial. Abutting on this tower towards the east, and completing the north front in that direction, is a gabled compartment with an angle-buttress, the gable pierced with narrow lights, and crowned with a finial, which presents two vertical sub-compartments, that to the east being a repetition of the four lower stages of the tower; while adjoining the tower itself are three tiers of transomed two-light windows, each window having an enriched arch, lighting the end of the central corridor of the building.

(To be concluded next week.)

DUDLEY GALLERY.—WINTER EXHIBITION.

THE multiplication of so-called "Exhibitions" is becoming a rather serious affair, both as regards the sight-seeing public and the character of our arts. Time was when "the Exhibition" was that of the Royal Academy, selected and put together by a controlling corporate body, which was responsible at least, however incompetent. Then followed other annual displays of recognised art societies, under special conditions of their own. In the earlier days we speak of purchasers were rare, and the exhibition too often brought empty honour rather than substantial reward. When the patronage of art became fashionable, however, the state of affairs changed, and the exhibition

became, in the fullest sense of the word, "a shop." It was not unnatural that under these circumstances the picture-dealing fraternity should step in, and, under the name and semblance of an "exhibition," open each his own bazaar for the traffic in pictures, which were sent in for the purpose on commission or otherwise. Under all these forms of exhibition the public had some guarantee, some assurance, against a positive inundation of incapacity or mediocrity in the persons of the managing committees or the status of the speculative dealer, who, in the way of business, had a character to maintain. Within the last few years, however, a new step has been taken in the business of exhibiting, or showing pictures for sale. The "artists"—chiefly those of the "rising" ranks, who have not yet obtained recognition in the established emporiums of art—form themselves into "co-operative associations," hire a room, dignified as a "gallery," for themselves, where they open shop on their own account. Of course these little ventures are styled "exhibitions," with the usual shilling entrance fee, and a shilling or sixpenny catalogue; and of course all the art critics go to them, and measuring merit in each object by a standard amiably adjusted to the average pretensions of the particular collection, never fail to find much to admire, or where admiration is impossible, much to encourage, in the performances of each self-taught aspirant; of course, a certain number of the public, who go everywhere, go to these exhibitions as to others, and of course some of the pictures are sold; and of course, what with admissions and sales, the concern is made to pay; and our art is brought into contempt and ridicule amongst foreigners who happen, on their occasional visits, to look in at these places, and who go away staggered with the impression that they fairly represent the British "School." It is not our province here to inquire how this state of things has come about, or to whom the fault is due; we have only to express the hope that one of these days a movement may be made to effect a remedy to so crying an abuse. If artists and would-be artists cannot or will not do what is wanted, let the "lay" element step in, and establish a commodious exhibition gallery of sufficient dimensions to accommodate all the "outside" talent of the day, to be managed by a committee of some amount of authority, and not entirely composed of the great "unschooled" themselves.

The above remarks, which we consider appropriate at the opening of an "Exhibition" season which promises to be of unexampled severity, are particularly applicable to "The Winter Exhibition of Cabinet Pictures in Oil," being the fifth, which has just been opened at the Dudley Gallery. The catalogue informs us that this display is made "under the management of the Committee of the Dudley Gallery," whoever they may be. In former years, as we recollect, the names of the gentlemen comprising the said committee were printed; this year they are omitted, leaving us to our own conjectures as to the fatuous influence under which this extraordinary assemblage of "pictures in oil" can possibly have been brought together.

The gallery itself, was not, we believe, constructed for the purposes of pictorial display, and is certainly not adapted to it, more particularly for pictures of small dimensions which require to be hung within a moderate height or depth from the line of sight. It is ill-lighted through three small circular skylights, or in dark weather, such as that on the day of our visit, by means of three star gaseliers, which pour their light over the middle of the room, rather than upon the walls; and then at an angle very trying to the vision. Poor as the lighting is, however, it is perhaps more than sufficient for the interests of the painters whose works are here thrust into view. It is no use mincing matters, and the first glance round the room convinces one that, for the most part, to say nothing of the want of

purpose and creative power in the artists, there is an utter deficiency amongst them of the merest technical acquirement, as in the knowledge and use of colours, drawing, &c., which renders their putting themselves forward as exhibitors at least premature, if it do not also suggest regrets for the obvious misdirection of time and labour from fields of industry more adapted to their individual natural endowments, whether it be in the counting-house, the tailor's board, the milliner's shop, or the still-room. As exceptions to the rule, there are certainly a few works of some degree of merit, either in point of purpose or execution, and others which claim especial notice on various grounds, which we shall mention presently. In the interim, let us dismiss, and dismiss as briefly as we may, some amongst many glaring instances which obtrude themselves in illustration and support of the sweeping condemnation we have just uttered.

Place aux dames! and with sorrow he it averred that, though "strongminded" in politics, the weaker sex are still weak in art. What could be conceived more "stale, flat," and unimpassioned than Mrs. Charretie's "Sylvia," dressed in lace bodice and pale pink skirt, with the gold chain her lover gave her dangling in her hand? Miss Ellen Stone in "New Knick-knacks" has some good furniture and curiosity painting, but "flatness" again. Where, let us ask, is the lady who is placed with her back to the fireplace supposed to be sitting, if not on the hob? Miss Rebecca Solomons' "Roman Peasant," Madame A. Ballot's "On Guard," Miss A. M. Thornycroft's "Study of a Head," and Miss Ellen Wilkinson's clumsy little wench, "She was eight years old, she said," are, amongst many others of a like sort, trivialities which in mercy should never have been suffered to make their appearance anywhere beyond the precincts of the school class. Harry Goodwin presents a striking example of unskilled labour and profuse waste of materials in the thick, rough laying-out of pigment in the "Swanbourne Lake, Arundel." E. W. Russell exhibits similar qualities in his corridor interior, "A Spanish Artist;" but both are surpassed in audacious coarseness by the "Study of Poplar Trees," of Henry Moor, and its neighbour, "A Sketch at Lynnmouth," by Albert Goodwin. Hamilton Macallum spoils the effect of a well-intentioned performance, "Sculling the Dingy," by a similar carelessness of execution, though not carried to the same extent. His other exhibit, "Poaching Sea Trout," though less reproachable as regards the work bestowed upon it, is, like his first-named work, open to the charge of too palpably borrowing from Hook. Charles Martin's picture of Venus floating in her shell displays a fearful legginess, in a sickly-bluish atmosphere. Val Prinsep's "Sir Harry Wildair" represents a female of very ordinary pretensions dressed in male clothes, with the back of her head absolutely jammed into a red brick wall. Arthur Hughes exhibits a similar want of appreciation of the importance of space, by representing his insipid "Ophelia" endeavouring to force her dislocated right arm into a tree; and in the same category of error we must put J. D. Watson's "When Lubin is Away," representing a very coarse sort of woman, sitting on a cliff, with joined hands, laboriously striving to look pensive, with a background of sea and cloudy sky, which threatens every moment to smother her. Simeon Salomons's "Carrying the Law in the Synagogue at Geneva" is carefully studied, with some good effect of *chiar' oscuro*, but the manipulation is painfully heavy. C. W. Wynfield's "The Fair Florist," a lady in white muslin watering flowers in the conservatory of a suburban villa, is attractive, though somewhat garish in effect: the handling crude.

J. E. Hodgson shows considerable spirit in "A Disputed Move," at a game of chess by Turks. Briton Riviere, in "His Only

Friend," treats with great naturalness a touching theme—a way-faring lad, reclining on a bank, his delicate features bathed in sleep, whilst he clasps under his left arm a rough, faithful dog, who keeps vigilant watch. A word of praise also to Field Talfourd for his prettily-treated female study, "My Bird." "The Chorister," by G. D. Leslie, A.R.A., is one of those fair creatures, full-eyed, light-haired, which he loves to treat classically, in a medium of cool gray, and most satisfactorily has he achieved his design. There is considerable humour in the "Village Gossip" of R. S. Marks, A.R.A. Whistler's truly original productions, "Variations in Violet and Green" and "Harmony in Blue and Green," are two of the coolest examples of—what shall we say?—well, "cheek," we ever remember to have met with on canvas. Imagine a smooth expanse of very pale blue or violet, intended to represent the sea, with a dab here and there suggesting rather than representing a ship, or a figure, as may be—all capable of being knocked off in a couple of hours; and imagine two hundred guineas being asked for one of these marvellous manipulations, the other being left "priceless" in the catalogue, and, bewildered at the modesty of genius, we may well exclaim, "What next?"

The "post of honour," as it is called, is awarded to a real Academician, G. F. Watts, R.A., who fills it with a "finished design for a large picture," entitled "The Angel of Death." Mr. Watts is an artist who has been forced into a good deal of undue notoriety by indiscreet friends, and whatever amount of success he may have displayed in imitating the manner of the old masters in portraiture, or rather the effect of their works as they would appear after three centuries of wear and tear, he is not destined, we apprehend, to emulate any part of the genius of those departed worthies in historical painting. The present effort, intended to be enlarged into an altar-piece (if a commission can be found for it), shows no improvement upon his large decoration of "Justice" in Lincoln's-Inn Hall, upon which the students at dinner have long since pronounced judgment. "The Angel of Death," who is a very respectable angel, after the conventional type, sits high up at the back of the picture, with wings wide extended; on his lap sprawls a defunct infant, which a disconsolate mother, in awkward elongated attitude, has just surrendered to him; in front are all sorts and conditions of men coming forward to deposit their credentials on a tombstone—the aged king his crown, the warrior knight his sword, the crippled beggar his crutches, &c., whilst on the right a young urchin, in rude health, tears aside the winding-sheet and smiles saucily, though what he sees to laugh at we cannot exactly understand. As to the composition, we have but a confused, incoherent jumble, the individual materials being but too palpably reminiscences of such originals as Raphael, Giorgione, Paul Veronese, Albano, &c. On either side of this ambitious but unfortunate performance hang "The Noble Argalus" and "Parthenia," by C. E. Hallé, intended to be after the *preux chevalier* and lack-a-daisical damsel model of the romantic ages; but the knight is terribly ungainly in pose, ill-favoured in feature; whilst my lady is a simpering miss, with very large awkward hands, tawdrily attired. We wish we could hope that they are not both portraits; a department of art to which Mr. Watts, being successful in it, would do well to confine himself, in all its simplicity. O.

PEDESTALS.

By THOMAS MORRIS.

THE great monuments of ancient architecture are massive and majestic, severe and dignified, pure, and apparently simple; but they are so only as gold is simple when all impurities have been cast out by subtle refinement. Such is the superlative merit

we acknowledge in the Parthenon. In sculpture and architecture alike, we refer to it as the touchstone of taste; and though in some respects unsuited to modern wants, it stands the prime representative of Classic art. Governed by their special purposes, buildings take every variety of feature, and each architect endeavours to express the conditions for whose fulfilment he is employed. In looking backward at the Parthenon, we encounter more than twenty centuries of changeable destiny, but certain family lineaments have never been effaced.

Architecture demands as the first element of stability for every building a solid and apparent footing, or platform next the ground. This construction is indefinitely called the "base"—a term that may be applied to any mass that supports another. It may be of any form, but commonly consists of a plinth and moulding. At Venice, the bases are often battered, or inclined like the sides of a riding-school. This form is not very frequently adopted here; but of the few instances, one may be seen in Park-lane, and another at the new Government Offices in S. James's Park. In Greek temples, the base consisted of two or three steps, and upon the uppermost of these the Doric columns stood without further preparation. At the temple of Theseus there were two steps, at the Parthenon three, and such was the base of the grand Doric temples in general. It received the name of "stylobate"—that is, a base for columns, and it is consequently to be used only where columns are present.

Another term for a base is derived from the amphitheatres. The arena was surrounded by a strong wall, twelve or fourteen feet high, at the top of which the seats for the senators began. The first row projected over, and had a gallery front or railing, while the flat soffit would effectually prevent the escape of ferocious animals exhibited in the spectacles. The enclosing wall was called the "podium," and the term has been extended to unbroken substructures of similar form, that is to say, with a plinth or base, a die or dado, and a cornice or surbase.

Not only did each receding seat in an amphitheatre possess an increased elevation, but groups of seats were raised by larger heights above each other. To each group there was a front wall similar to that next the arena, with apertures at intervals for communication with the stairs and corridors. Upon the uppermost of these divisional walls was placed a range of columns, and the crowning effect of so noble a peristyle is represented in Canino's illustration of the Coliseum. The best approach to such an effect in modern buildings is the arcaded gallery of the Royal Albert Hall. The exterior of this hall being without columns is well calculated to display the podium, the absence of which is remarked at the Roman Pantheon. But here (at Kensington-gore) the feature is thoroughly developed. The ornamented base, panelled die, enriched frieze and cornice, constitute an excellent design, somewhat roughly executed in terra-cotta—a material more subservient of ostentation than of sterling art. Cast-work always savours of endless and mechanical repetition.

Several temples at Rome had bases of the podium form. Of that of Fortuna Virilis, Messrs. Taylor & Cressy remark that the stylobate is in height between a third and a fourth of this order. The circular temple of Vesta at Tivoli is a well-known example; and the little temple of S. Peter in Montorio may be named. It is given in Le Taronilly's book, and was erected for Ferdinand and Isabella, from Bramante's design, at the beginning of the sixteenth century. The late Mr. Wilkins introduced the podium at the National Gallery, where there are columns, and at S. George's Hospital, where there are none. It appears in that most admirable work of Mr. Basevi, the Fitzwilliam Museum at Cambridge, engraved in

"Memorials of Cambridge," by Messrs. Wright & Jones, who use the word stylobate for the base, and term the unbroken attic, at the top of the building, a podium. A similar block surmounts the Wellington arch at Hyde Park Corner, where Mr. Decimus Burton has freely imitated the arch of Sergio at Pola. No more elegant example of the podium can be adduced than the Pandroseum at Athens presents; and the peristyle of the mausoleum at Halicarnassus had an equally lofty basement. One of these buildings has a series of noble statues, and the other columns, but Fosbroke, on the authority of Winckelman, says that, as the first statues were mere stones and shapeless blocks, the Greeks used the same word for columns and statues, even in the best times. Podium and stylobate would therefore appear interchangeable; but a discriminative employment of podium and attic seems at least to be desirable. The place of the one is at the foot and that of the other at the summit of an edifice.

The arch of the Goldsmiths at Rome—that so-called arch without an arch—has a podium to each pier, and the arch of Trajan at Ancona has a complete podium, raising the arch proper to the level of the causeway by which it is approached from the sea. When there are columns, and the constructed base, which, but for their occurrence would be a podium is broken forward, or as it may happen detached, to support each column, the parts so thrown forward or detached are termed pedestals. The word is derived from the Greek for a foot, and a column. The French synonyme is *pedestal*, the Italian *piestalto*, and the Dutch *voet-stal*. This kind of substructure was of somewhat late introduction, and is not found in the purer Greek examples; but very beautiful instances occur in the decorative monuments of Rome. At the arch of Septimius Severus the detached columns are on pedestals charged with figures in *relievo* that lend a graphic beauty to the work, and are so lofty as with their sub-plinths to bring the bases nearly up to the impost of the side arches. Similar in this respect is the arch of Constantine, freely imitated by John Nash, in the very handsome structure called the Marble Arch, originally erected at Buckingham Palace, and which now forms the stately entrance to Hyde-park. It is an ornament deserving its conspicuous site, and of completion by sculptural accessories to indicate the history or current appropriation of the place. Riding, walking, bathing, military exercises, and the acquisition of the park are obvious texts for illustration. Gwilt, in his Encyclopædia, does little more than dissuade the student from using the pedestal, but in the short essay prefixed to his "Notitia Architectonica Italiana" he describes its parts and proportions. Columns on pedestals have been compared to men upon stilts, but Sir William Chambers appreciates their claims, and describes the usage of several masters. He admits their value in raising the bases of columns nearer the eye, in reducing the height, lightening, and thereby improving the effect of an order. Situation he considers may sometimes necessitate pedestals, and refers to the Luxembourg as an instance in point; but the illustrations of this palace by M. Gisors hardly sustain the selection. The pilasters of that palace, like those of our S. Paul's, are coupled, and the pedestal in each case serves for the pair.*

Raphael's design of the Palace Stoppani at Rome, or the Canossa, by San Micheli, at Verona, would have served as well as the Luxembourg, while Giulio the Third's Palace by Vasari, and that for the Count Chiericati, by Palladio, at Vicenza, would have done better. *A fortiori* should be remembered the Palais du T at Mantua, so called from the figure of its plan (designed by Julio Romano), a perfectly regular pile, with the

pedestal fully adopted as part of the order. The incident of the initial reminds one of the adoption of the E in Elizabeth's reign, and of John Thorpe's J and T.

Vignola, who used pedestals at the Caprarola Palace, fixed their proportion at one-third of the supported order, and gave to the die a width equal to that of the plinth at the columns base. This made the pedestal more considerable than it had been in early times, as notably the Pantheon of Hadrian at Athens. Inigo Jones did not use it at Whitehall, yet although he placed his columns upon a continuous basement, he broke the entablature, and his example is followed by Messrs. Banks & Barry in the Piccadilly front of Burlington House. In general, however, where the aim of the architect has been to make his work cheerful and ornate, the pedestal has found favour. It is employed in the Strand front of Somerset House, and the principle may be said to have been adopted by Sir James Pennethorne in Burlington Gardens, where square pilasters are substituted for columns. It is seen in the Foreign Office by Mr. G. G. Scott, and Mr. Frederick Porter has executed it in granite at the Union Bank, Charing-cross.

THEORY OF THE ARTS.

ARCHITECTURAL COMPOSITION.—WOOD AND IRONWORK.

(Continued from page 264.)

IN the last article it was said the successful preservation of wood by means of immersion in water, impregnation with chemical solutions, as mineral acids, tars, and essential oils, coatings with paint, has not yet been attained, though the value of such processes or saturations much depends on the state of the timber at the time, and its thorough desiccation by a slow process—no less than a thorough impregnation or coating with such preservatives, which, however, is seldom perfectly performed in practice. The great secret is in extracting the soluble matters of the wood, as the sap, or preventing it from undergoing fermentation or chemical change, which makes it susceptible of decay and the ravages of insects. Protection against fire, also, is a matter yet incompletely fulfilled, as no solutions or sheathing in metal have answered the end proposed, or at least are more than partially effective. The combustible property of this material renders it on this account improper in constructions of many kinds, and the lamentable fire of Chicago alone is a sufficient lesson to architects for all time, and makes us wish that some process could be devised which would effectively render wood, at any rate, proof against the first attacks of that destructive agent.

Mechanically, the application of timber is a subject that has elicited a large amount of learned theory and practical experience. Tredgold, Barlow, Rondelet, Emy, and a host of other experimentalists and practical men, have devoted a lifetime to the elucidation of the principles of carpentry and the strength of timber; but they have all treated the subject from the utilitarian point of view, and have left the architectural student here. The æsthetic or artistic treatment of woodwork has been thus comparatively neglected, and many of the ancient examples, while they show a keen appreciation of art as applied to the material, are, nevertheless, either ill-adapted to our modern ideas of taste, and comfort, and economy of material, or are defective in a mechanical point of view. In short, we have abundance of examples of timberwork designed on purely mathematical principles, and a valuable collection of ancient woodwork, designed with purely artistic feeling, but each wanting the combined excellences which only a philosophical study of the subject can adequately give. The principles on which ancient woodwork was designed hardly meet the extended experimental knowledge we now possess, though it cannot be doubted we

* In the grounds of the Luxembourg a pleasing little grotto of kindred design to the water-gate at the Adelphi has the pedestal single and detached.

are too prone to keep within the narrow limits assigned by mere custom or rule, and do not sufficiently apply our better mechanical knowledge in an artistic direction. Lately, indeed, some tentative study has been bestowed under the influence of ecclesiastical art, or an archæological resuscitation, if I may so term it, of the spirit of Mediæval woodwork has been attempted; but from its falling so far below our scientific standard of perfection, it must necessarily be a mere fashion, short-lived, and void of any defined influence on the future of art. Such studies, however, although imperfect and wanting in result, may help the great movement of scientific generalisation as applied to all art material and workmanship. Each man has a speciality or hobby which predilection of education or mental bias may give him, in which some crotchet, idea, or association is uppermost; but by the co-operation of all artists and workers, however diverse and opposite their lines of action may be, or seem, a result favourable to art may be expected ere long. Thus we have our engineers working in one channel, our artists and architects in another direction, and their combined action cannot be resultless if they are only true to themselves and their respective arts. With our imperfect knowledge there must ever be an impassable gulf between utility and taste, between the simple, plain, decisive adaptation of material and the remoter feeling of art. Thus, what seems the clearest and most sensible method of using our wood and iron is not always that which we can admire; but by careful study and a thorough acquaintance with the properties of materials we can often attain in some degree to such combined effect, and meet approximately some of those laws of beauty which appear inscrutable.

"Mass" and "weight" were said to be the chief essentials in stonework, inasmuch as the resistance of stone to cross strain cannot be depended on, the cohesion of its particles not being reliable. While, therefore, simple compression is the chief action to which that material should be subject, in timber, from its toughness and natural elasticity, we have two additional forces or pressures to which it may be exposed—namely (1) cross strain and (2) tension. From these conditions it is clear quite another and very opposite condition of structure is imposed—namely, "lightness" and "length" in proportion to the resistance it has to offer, for it must be considered excessive cross-section or thickness only adds weight without equivalent advantage—a remark that some of our architects seem to ignore in practice. For cross-strain, the strength of a beam is "directly as the breadth and square of the depth, and inversely as the length," or the ratios of strength to dimension is—

$$\frac{b \times d^2}{l}$$

Results from the experiments of Barlow and others show that for fir less than half of the cross-section or fibres are engaged in resisting the force of tension, the greater portion being employed in the resistance to compression; therefore the neutral axis, or plane, as it is termed, is rather below the centre of the depth of a beam. It will not be necessary here to enter into the mathematical theory and results relating to the strength of timber—a subject which every student should be familiar with. From the simple formula used it is obvious what proportion depth should have to width and length in beams or timber subject to cross-pressures. If this rule were more thought of, we should never see a square-sectioned beam, rafter, or joist, and certainly never one placed flatwise. The stiffest section for timber is that whose breadth is to the depth as .58 to 1; Rondelet and other French writers make the ratio as 5 : 7. Circumstances may vary this ratios in some cases and in all instances an allowance for the purpose of the carpenter must be made in excess of the rule. Barlow gives one-fourth the

breaking weight as the maximum load; but beyond this, especially in timbers framed, a much less weight than that must be allowed—one-tenth or twelfth as a margin for constructive use. It must also be remembered that stiffness, or resistance to deflection, must enter into our calculations, as the least degree of curvature may often sadly mar our construction where straightness is an object, as in a floor. The deflection of a beam is directly as the weight and cube of the length, and inversely as the breadth and cube of the depth. Of course, for different woods the value of deflection varies; and Duhamel and Tredgold have investigated this, and fixed "constants" by which it is easy to calculate the thickness required, assuming one-fortieth of an inch to the foot as a sinking that would not be noticed. It is found that the greatest results of transverse strength with the minimum of material are not obtained by parallel-sided beams, but by forms more or less curved. Thus a beam supported at both ends, and loaded in the centre, requires either its upper side convex towards the weight, formed by two parabolic curves, or its horizontal section or plan of a similar shape. If loaded uniformly, the curve assumes an elliptical form on its upper side. Again, a beam fixed at one end and loaded at the other—a case that occurs in cantilevers, brackets, &c.—the form of equal strength is that of a parabola on the under-side, the breadth being constant; or when such a beam is loaded uniformly it assumes a triangular shape, the wall being one side of the triangle. These results, though seldom or never applied in practice, may be usefully suggestive; while regarded æsthetically, the convexity of a beam bearing weight is far more consistent and in harmony with our ocular notions of strength at least.

Transverse strain, which may be considered as a composite action in which compression and tension are combined, is that to which timber is most exposed in the constructions of the carpenter, and we may sum up generally the following cases:—1. When the beam is supported at the ends and loaded in middle, the ordinary case in construction. The formula in this case we have given. 2. When the beam is fixed at both ends and loaded in the middle, we take $\frac{1}{3}$ the breaking weight. 3. When the beam is fixed at one end and loaded in the middle, we take $\frac{1}{4}$ the weight. 4. When it is fixed at one end and loaded at the other, we take $\frac{1}{4}$ the weight. When the load is uniformly distributed, double the weight is required to produce fracture than if placed in the centre. 5. Inclined beams as rafters. Here the breaking weight equals the same beam placed horizontally multiplied by its length and divided by the horizontal distance between supports. In all the above cases the specific value of the strength of the material used, or the "constant," has to be introduced into the calculation.

Resistance to tension is a condition of the material which, though often called into exercise, may in some cases be better supplied by iron. Here the strength must be proportional to the area of section, and it is only necessary to find experimentally the constant or tabular number for each kind of wood with which to multiply this area; the fourth of this result is considered the safe tensile strain.

Resistance to compression. This is a condition of the material often usefully called into requisition. M. Rondelet arrived at the conclusion that resistance to this force does not sensibly diminish in a prism the height of which does not exceed eight times its base, a higher proportion tending to bend. The strength or resistance, according to Tredgold, is inversely as the strain in all cases of columns or supports, or the strain is directly as the weight and square of the length, and inversely as the diameter. We have seen, then, that wood is capable of resistance to the three different forces or strains which can possibly occur in static construction, or can fulfil the offices of column or strut, tie and beam, though further investigation and study

will eventually assign to it, perhaps, a more limited sphere of use in combination with iron and other materials.

The combination of timbers in systems of framing, or to fit them for the purposes of a building, requires a further knowledge of mechanics, or that very useful principle the composition and resolution of forces, the rules of which are so well known as not to require repetition here. The assemblage of the parts of a truss might be seriously disarranged by a want of such knowledge, or the unequal strains produced by an insufficient resistance or abutment of one part may considerably affect those to which minor attention may be given. In designing systems of framing the values of the different strains can be easily ascertained geometrically and with sufficient accuracy by completing the parallelograms of forces, and taking the respective and proportionate distances by scale. The actions of loads on certain parts of a truss cannot be too much studied; for example, in rafters the greater the obliquity of them, or the higher the pitch, the less direct will be the weight; while a diminished load on a horizontal rafter or a roof of low pitch will be increased by direct action. Again, it must be considered that as the resistance of beams is inversely as their length, so must their scantlings be regulated. It should be known that the angle of least strain when the rafters are uniformly loaded, is about 35° ; the angles, indeed, made by the pieces or component parts of a frame with each other determine in a great measure the amount of the strains produced. It is of great importance to know which is a strut, and which a tie, in a system of framing; but this is a matter often difficult of immediate discrimination, and we cannot always have recourse to practical exemplification or experiment. In the majority of cases, however, it is readily perceived which piece of the framing or truss could give place to a rope, or in other words, which is in a state of tension; but it is often difficult to know precisely whether a certain piece is not under the influence of more than one pressure—namely, a compressible and a cross strain, or a tensile and a cross strain; or, in other words, whether a particular member of a piece of framing is in so direct a position as to receive a direct action of the pressure. The test of the rule adverted to will in all cases solve the doubt. As a general rule, the strain on any piece is proportional to the sine of the angle which the strain makes with the other piece directly, and also that inversely made by the pieces; because the sides of a triangle are proportional to the sines of the opposite angles.

G. H. G.

(To be continued.)

ITALIAN FURNITURE AND BUILDING APPLIANCES.

THE following notes on Italian furniture and building appliances are taken from a report in the *Journal of the Society of Arts* on the National Exhibition of Industrial Products:—

Furniture.

The principal materials employed in Italy at the present moment for the manufacture of furniture are indigenous walnut-wood and iron. The former has been used for centuries by the cabinet-makers and ornamental workers throughout the country. It assumes the same place which mahogany holds in England, and only of late years, and in certain towns, on account of its increasing rarity and high price, is employed as a veneer, being usually solid, while cherry, apple, and pear wood, generally stained, are used for commoner furniture, and iron is rapidly becoming the only material for bedsteads. We have before our eyes a remarkably beautiful variety of juniper (*Juniperus sabina*), the variegated tints of which, wine-red and straw-yellow, with all the intermediate shades, offers a material which, when judiciously worked up in inlaid furniture, has a peculiarly fine effect; unfortunately, this has not been in the least degree taken advantage of in the samples of work presented on this occasion.

The most important manufactory of furniture in Italy, almost entirely made by machinery, is that of Levera Brothers, of Turin. Their exhibit shows the quality of work turned out by them, but gives but a very poor idea of the infinite variety of branches which they embrace, commencing with the sawing, carving, and adapting the wood-work, the upholstering department, the manufacture of fringes, silk fabrics, bronze and iron castings, and ending in the retail trade in the objects manufactured. Nor is it to be passed over in silence that there is a school of design in the establishment to form able workmen.

Bothard, of Florence, has sent a good set of samples of his gilt mouldings for pictures and other frames, admirably manufactured, and largely supplied to retail vendors in all the principal towns. Gargiulo, of Sorrento (Naples), is perhaps better known to British and American tourists than to his own countrymen; his accurate and tasty inlaid mosaics, which take the name of the town whence they come, are artistic, and bear a peculiarly Italian stamp. In all probability, the art was carried thence to Tunbridge Wells, where a very similar trade is carried on. The defect of these mosaics is the great ease with which they come to pieces when placed in a damp spot—an evil which might be, in some degree, remedied by employing the strongest glue. Lancetti, of Perugia (Umbria), who stands far higher as a manufacturer of mosaics of a more artistic nature, exhibits this time some admirable samples of inlaid mosaics applied to card-cases, album-covers, &c. In addition to the use of stained woods, and engraved ivory with ornamental designs, figures, &c., for which he is so celebrated, he has combined geometrical borders having so close an analogy with Bombay work as to show that he has studied Indian manufactures to advantage. He cannot, indeed, come up to the exquisite minuteness of the latter, but the introduction of figures breaks the tiring monotony observed in the Oriental patterns, and the introduction of engraved figures is so important an improvement that we may venture to suggest that Indian workmen, when making their mosaic, should be counselled to insert Classical ornaments in carved ivory, which could be easily supplied them from Italy for that purpose by the merchants who purchase such manufactures for the European market. The subject is worthy of the attention of those interested in the development of taste in India; and we venture to hope that Dr. Forbes Watson will take up the idea in the India Museum in London; for, though at first sight it might appear to be mixing two styles essentially different, the artistic effect is so remarkable that it defies too severe a criticism.

Paper-hangings are principally used in northern Italy, where, indeed, the influence of the neighbouring countries is seen at every step. Elsewhere, the more national custom of fresco decoration prevails, whether executed by hand or by the aid of designs cut out in wood, metal, or other material. Since manufactures of machine-made paper have extended in many places, a considerable impulse has been given to the manufacture of paper-hangings, which sell at from 0-30 lire the roll of metres upwards. The specimens, however, observed in the exhibition are principally of the better class, many of them highly commendable for the taste displayed, showing the excellent influence exerted by the numerous schools of design which exist in all the towns of Italy of some importance. Although the patterns are inferior to those manufactured at Mulhausen, they show a decided improvement on the productions of a few years past, and may be fairly ranked as decorative papers. One point in particular may be noticed, which is the introduction more generally of a ground, with designs better grouped than formerly, leaving more repose to the eye than where the entire paper is surcharged with a pattern on its entire surface. The patterns themselves are less vulgar and commonplace than they used to be, and the colours combined with better harmony and contrast. Among the best samples sent are those of Oggioni, of Milan, and Ferro, of Turin.

As accessories to furniture may be mentioned the ornamental castings of Colla & Company, of Turin, well worthy of examination; while Pellas has sent from his electro-chemical laboratory at Florence some good samples of oxidised silver work, imitated from Collins and other masters, now made so cheap by the scientific applications of the day as to be accessible to a large proportion of the community, and highly suitable for purchase by travellers who sojourn for any time in the artistic capital of Italy.

Building Materials.

Chinaglia, of Turin, has samples of bricks made in his continuous kilns, rendered so famous of late by the war which has waged in the courts between him and Hoffmann, who accused the former of having infringed his patent. There is a decided pro-

gress in brick and tile making in these products—always limiting these observations to what has been done elsewhere in Italy. The little hand-machine for making the bricks, invented by Chinaglia, consists simply in a table, on which are disposed one or two brick-moulds. The clay is pressed into these by means of a heavy iron frame-work, moving on a hinge behind. The brick is raised by a lever, acting by a pedal. He does not exhibit any machine for mixing the clay, but the homogeneity of the products seem sufficient to indicate that he must employ one. The ornamental tiles are highly ingenious. He does not make them like Minton and others, but forms a design in the act of making the tile, so as to produce a hollow. This is afterwards filled with plaster of Paris, cement, asphalt, &c., so as to produce the most accurate patterns of the desired colour. The inlaid pavements in Venetian mosaic, exhibited by Gianoli and Co., of Firenze, are very well made; they consist of small pieces, in the form of lozenges, hexagons, squares, &c., which can be easily united to suit the floor, previously covered with a layer of cement. Hitherto it has been the general custom to imbed the fragments of marble, serpentine, and other stones on the cement in the apartment or passage itself, and afterwards to rub the surface until the whole formed a smooth plane. The cost of such mosaic tiles is from 6d. to 1s. per square foot.

Hydraulic cement is being much more largely employed than was at first anticipated, not only for subaqueous constructions and foundations, but also for making bridges, flooring, &c., but we are not aware of its being applied anywhere so admirably as at Grenoble, and elsewhere in France, where the whole fronts of houses are faced with cement, previously moulded, and then put in the walls. The Upper Italy Railway Company possess very extensive cement works at Palazzuolo, near Brescia, where they have applied all the modern improvements for its manufacture, packing in sacks, and carriage to the main line, whence it is conveyed to all parts of their immense railway system, extending, as it does, from the Alpine tunnel at Bardonnèche to the Austrian frontier, near Trieste, and from Turin to Florence, with all the innumerable branch lines.

Next to this we find a sample of agglomerates employed in the submarine station of Venice, consisting in a block of $10\frac{1}{2}$ cubic feet (1 cubic metre). It is formed of—

Hydraulic lime	0 30
Sand, perfectly dry	0 50
Gravel, perfectly dry and sieved 1 00	
Water (fresh) 120 litres	0 12

and, after having been submerged for four years at Venice, is perfectly sound and solid.

Other cement works exist near Bergamo, and serve for the use of the public. The samples are from the Bergamask Company for the manufacture of chmeut and hydraulic lime in that city. This company was formed in 1864, and is now able to produce 20,000 tons of cement and hydraulic lime yearly. The imitation Portland cement competes with that hitherto imported from the Tyrol and Grenoble. Among other places where the Bergamo cement has been applied may be mentioned the crypt of St. Mark's, at Venice.*

Two quarry-masters of Luserna, in the Waldensian valleys (Turin), have sent slabs of gneiss and worked pieces of the same material for window sills. There is nothing new in this material; the streets, not only of Turin, but of most of the cities of northern Italy, excepting those near which quarries exist, are flagged with the stone of Luserna, one of the best kinds in the country. Many persons have an idea that the nucleus of the Alps is crystalline, which is not invariably the case; indeed, in piercing the Mont Fréjus, in the whole distance of 12,200 metres, only clay-slate and a stratum of quarryite were met with, but no gneiss or other crystalline felspathic rock whatever. This gneiss is largely employed even at present in Alpine country villages for roofing; and possibly where the weight of the snow in winter is very considerable, and the winds strong, it is preferable to tiles, which are easily blown off during the gales so prevalent in mountainous regions.

S. JAMES'S CHURCH, DIDSURY, LANCASHIRE.

ON Friday, October 20, this church was re-opened, after having undergone important alterations, the sermon being preached by the Bishop of Manchester. The original building, according to a local authority, was one of the most ancient outlying chapels in the parish of Manchester. In 1235 it

* Prices of the products per ton at Bergamo:—Portland cement, £4; slow setting cement, £1 1s.; quick setting cement, £1 8s.

was probably only a private oratory, limited to the use of the Lord of the Manor, or the influential persons who planned its erection, but increasing in importance and size in proportion as the tenantry were permitted to worship in it, it became a parochial chapel in 1352. In 1620 it was rebuilt, and then, for the first time, a tower was added. At the eastern extremity of the north aisle, where the nave and chancel join, was a clear space about 9ft. by 6 ft., which marked the Barlow Chapel, the Barlows being an influential Roman Catholic family in the adjacent township of Chorlton, whose more customary place of interment, however, was in the Collegiate Church (now the cathedral) of Manchester. A corresponding space on the opposite side marked the Mosley Chapel, being for the use and benefit of the family who owned, amongst other lands, "Hough's End Clough." The principal monument in the church is to the memory of Sir Nicholas Mosley, of the Hough, and formerly Lord Mayor of London, and bears the date of 1612, which is associated with Queen Elizabeth, from whom Sir Nicholas appears to have received some handsome presents of furniture for valuable services rendered by raising 6,000 soldiers and sixteen ships of war to meet an apprehended attack of the Spaniards, to avenge the catastrophe of the Armada by a fresh attack upon England.

At a subsequent date the two chapels appear to have been formed into a continuation eastward of the north and south aisles, pewing placed therein, and arches (two on each side) formed opening towards the chancel; north and south galleries, and a west or organ gallery, were also erected.

At a more recent date the outside walling was refaced with stone, and rich Perpendicular traceried windows replaced those which appeared as though they had been borrowed from the adjoining cottages.

In the present alteration the church has been extended eastward by the addition of a new chancel, 30ft. by 19 ft., the old chancel being taken in and paved for a continuation of the nave, which previously was too short, and which is still further improved by the taking down of the cumbersome north and south galleries. May they soon be followed by the west gallery, and a more suitable place found for the organ! The new chancel arch is of stone, boldly proportioned; double shafts are ranged at sides, with moulded octagon caps and bases, these carrying deeply-shadowed arch and label mouldings with carved boss terminations. The pulpit is of oak, hexagon in plan, with carved and uncarved panels, and buttresses at angles with cap mouldings, bearing a memorial inscription. It has been made by Messrs. Sidebotham & Co., of Manchester, from the architect's designs. The reading-desk is also of oak, with open traceried front, and shaped and traceried ends. The side windows of chancel are filled in with memorial stained-glass windows, in illustration of the following subjects: "Abraham offering up Isaac," "The Good Samaritan," "The Parable of the Pharisee and Publican," "Christ blessing little children," and "Christ teaching in the Temple." These windows are by Messrs. Lavers, Barrand, & Westlake. The east window is also filled with stained glass, removed only from its old position and refixed. The reredos, a former gift of the present rector, has been refixed.

A font cover has been presented, the work of Mr. Skidmore, of Coventry, and comprises an oak top, with the inscription "Suffer little children to come unto me" round the edge, surmounted by a wrought iron crocketed canopy, filled in on the sides with scroll work. The wrought iron standards to chancel seats, as also the gas pendant, have been manufactured by Messrs. Hibbert & Co., of Manchester. The new chancel has been built by a lady in memory of her mother, the other part of the work having been undertaken by the rector, churchwardens, and congregation. The contract for the whole was taken by Messrs. Clay & Sons, Audenshaw, for the collective sum of £1,300, the stonework being sublet to Messrs. Ellis & Hinchcliffe, of Manchester. Messrs. T. R. & E. Williams have done the carving, and the architects are Messrs. Hortou & Bridgford, of Manchester.

CHIPS.

The death is announced from Brussels of M. Philastre, the decorative painter, who was pupil of Cicri, and who in conjunction with Cambou, had been the decorator of the Opera, and almost all the other theatres.

The works for the new public Public Hall at Dorking are in rapid progress, under the direction of Mr. Shearburn.

New schools for the picturesque village of Churt, near Farnham, Surrey, were opened last week. The building has been erected at a cost of about £500 by Mr. F. C. Birch, from designs furnished gratuitously by the architect, Mr. E. Woodthorpe.

A STORM IN A TEA-POT.

THE newspapers—we suppose, for want of something better to talk about—have been writing somewhat sensational articles under the heading of “The New Social Movement.” It was stated that a combination had been formed between certain leading Conservative lords and a council of “representative working men,” in order to carry out a certain extraordinary programme, consisting “of passing a homestead law, by which the families of our workmen may be removed from the crowded quarters of the town and have given to them detached homesteads in the suburbs,” of “a municipality for every town and village, with power to acquire and dispose of land for the common good,” the buying of the railways by the Government and working them for the public advantage, &c. It was supposed at first that the whole affair was a hoax, but it subsequently transpired that certain negotiations had taken place. First, the lords whose names were mixed up in the matter repudiated having made any such arrangements as those imputed to them; next came a full explanation from the lords, saying what they had agreed to, which in reality was next to nothing; and then came the explanation of the so-called working men. We need scarcely say there is an immense gulf between the conditions of amalgamation as stated by the lords and those suggested by the working-men. Mr. Scott Russell, who has not been pre-eminently successful in other engagements in life, has acted as a kind of self-elected go-between, and has, to all appearances, perplexed and mystified both parties, and with him rests the credit or discredit of originating the negotiations, and bringing them to an inglorious end. No doubt all the parties concerned have misunderstood each other. In all probability the so-called working-men magnified (and that to a great degree) the diplomatic abilities and influence of Mr. Scott Russell, and Mr. Scott Russell magnified, and that to a great degree, the abilities and influence of the “representative working men;” and in all probability the lords, who should have known better, fell into similar error with regard to the negotiator and the said “representative working men.” Understanding each other a little better, they will no doubt in future act a little wiser. It appears to us that the great mistake the lords and the newspapers who have commented on the proceedings have made is a misapprehension of the power wielded by certain self-styled “representative working men.” Those men in London who frequently manage to make the most noise possess the least influence. They represent not one but themselves. As a rule, they are neither working-men nor middle-class men. The following are the names of, we believe, the self-elected “council of representative working-men:”—Robert Applegarth, Daniel Guile, George Howell, T. W. Hughes, Lloyd Jones, H. Broadhurst, F. Whetstone, John Deighton, Alfred Barker, J. Squires, R. M. Latham, Joseph Leicester, William Swindlehurst, and George Potter.

We may say we are well acquainted with what are called and what are supposed to be the leaders of the working men in London—we mean leaders in an agitating sense—and we say we never heard before of seven out of the fourteen above names, and these are D. Guile, T. W. Hughes, H. Broadhurst, F. Whetstone, John Deighton, A. Barker, and J. Squires, and of the remaining seven George Howell and William Swindlehurst are secretaries of building societies; R. M. Latham is a patent agent; Lloyd Jones is half writer and half lecturer on socialism and other “isms,” and has been for a quarter of a century; Mr. Applegarth is (or was until recently) the well-known secretary of a trades union; Mr. George Potter is half journalist and half Parliamentary agent; and Mr. Joseph Leicester is a *bona-fide* working man. Now, without wishing to dispute for a moment the respectability of any of those names, we may say that unless they were delegated to represent bodies of working-men, they are in no way entitled to call themselves “a council of representative working-men.” Let them speak in their own names if they will, but let them not deceive

themselves and other people in thinking or in styling themselves the representatives of others. Had they been known in their true capacity, the lords above alluded to might have saved themselves much trouble, and the newspapers who have made so much to-do about nothing might have written on more profitable subjects. Our advice to the true working-men of the country is to trust neither lords nor any “council of representative working men,” but in all endeavours to ameliorate their condition to rely on themselves.

ARTIFICIAL STONE AS A FIREPROOF BUILDING MATERIAL.

MORE than once, when describing the premises, erected by Messrs. M. Allen & Son for the Industrial Dwellings Company, we have referred to an artificial stone manufactured and used by them for all purposes where stone is usually employed. The artificial stone consists of Portland cement and breeze, coke refuse or slag, in the proportion of from 5 to 7 of the former to 1 of the latter. Its cost is about one fourth that of stone, and an idea of its qualities of endurance may be obtained from the fact that a step of it will outlast several cut from York stone.

The recent fire at Sir Sydney Waterlow's premises in Hill-street, Finsbury, has very clearly demonstrated the value of the material in fireproof construction. It was then used side by side with stone, and the comparison of the fire-resisting qualities of the two materials is thus easily established. In almost every case where the fire reached the natural stone it is shivered and split to pieces or has altogether given way. In every instance where the artificial stone has been subjected to the ordeal it remains intact, and with its outline as sharp as on the day it was fixed in its place. In the windows of the building the dressings were of the artificial material, and on them were bedded sills of natural stone. The latter is in fragments, the former unbroken, and in most cases uninjured in the slightest degree. It is, indeed, about the only material used in the construction of the building that has stood the fire. Even the brick walls are rent and shattered, and girders and stays, where unprotected, are distorted and fractured. Mr. Allen himself, though always maintaining its good fire-resisting qualities, confesses that it has surpassed his own good opinion of it, and intends, in future, to use it more largely than heretofore. His principle is to look to iron for strength in construction, but to clothe it with this enduring fire-resisting stone—to use his own simile, as the bones on which the human body depends for strength are clothed and protected by the flesh and muscles. A brick building in which no lath and plaster partitions were used with floors and stairs of the artificial stone, and with every girder and stay surrounded with the same material, would, the inspection of the premises at Hill-street convinces us, be as nearly as possible absolutely fireproof.

There are other well-known means for providing against fire similar in principle to Mr. Allen's, which can be adopted in the case of arches and floors; but as his artificial stone is fireproof in itself, and apparently confers immunity from fire on whatever part of the building it forms, its employment should become a question for the consideration of all interested in the preservation of buildings from fire.

HEATING THE CONSERVATORY.

HEATING the conservatory by means of gas is (says the *Gardener's Magazine*) understood at present by comparatively few amongst the many who might be advantaged by it. Only in the neighbourhood of towns is this mode of obtaining heat available, and it is in the urban garden for the most part where gas-heating is most required. The subject may be disposed of in a general way for the comfort of such as prefer a summary to an argument by the remark that a plant-house may be heated with gas in a most efficient and cleanly manner, and the heating apparatus will occasion less trouble in management than any kind of apparatus requiring any other kind of fuel. But the conditions of success in this business are somewhat narrowly defined, and a

mistake at any point may result in disasters, or, at all events, in a failure so complete that it will be needful to undo all that has been done and begin again. One of the most important conditions of success is to apply the system to plant-houses of comparatively small size. As a matter of fact, the greatest conservatory ever constructed could be heated by means of gas to perfection, but the cost of gas is necessarily high, and when we have to deal with a large house it becomes a sheer waste of money, and a most extravagant waste too, when gas is employed. It is a question, of course, what is meant by the term “comparatively small size,” and we should be disposed to draw the line for practical purposes between houses larger and lesser than about 40ft. in length by 10ft. or 12ft. in breadth. The kind of structure for which gas is best of all adapted is the so-called conservatory which is usually attached to the town residence, the length and breadth and height of which rarely give so large a cubical area as the ordinary low-roofed plant-house 40ft. long by 10ft. or 12ft. wide, which we have instanced as the largest structure to which gas-heating may be applied conveniently. The principal advantage of gas-heating is that stoking is dispensed with, and if the pressure on the pipes is pretty constant, the apparatus may be left for many hours without attention, as the heat given off will be constant, and to a great extent determinable beforehand. It must not be concealed, however, that to manage a gas-heating apparatus requires some amount of experience, and those who would succeed must habituate themselves to observation, not only of the action of the apparatus, but of its influence on the temperature of the house at different hours and in different states of the weather. A body of flame sufficing only to keep out frost on a frosty night with a clear sky might suffice to raise the temperature of the house to 70° to 80° on a mild night with a cloudy sky, and, as a matter of course, alternations so great and sudden would seriously injure the plants the apparatus was intended to preserve.

WEST BROMWICH TOWN HALL.

WE give this week an illustration of the selected design for the West Bromwich Town Hall and Commissioners' Offices. Our readers may remember that in this competition twenty-nine architects submitted designs, and that upon the recommendation of Mr. Ewan Christian, who was requested to report thereon, the first premium was awarded to Messrs. Alexander & Heman, of Stockton on Tees and Middlesbro'. As the cost of the building is limited, it has been necessary to use materials of an inexpensive description, and to keep the design as simple as is compatible with a certain character required in a public building. Red bricks and terracotta, with but a small quantity of stone, are employed for the main structure. The roof of the large hall is formed of semi-circular iron ribs, east to ornamental patterns. These last and the walls are intended to be relieved by colour. Great care has been bestowed upon the internal arrangements, which will be understood by reference to the plans.

ORPHANAGE OF S. JOSEPH AT SCHAER-BEEK, BRUSSELS.

WE give a perspective view and plans of this Orphan Asylum, which was built last year. The building was erected for orphans left to private charity. The architect, M. Carpentier, of Beveil, in a letter to us says, “It was begun with but very small resources, as we cannot find assistance for such things as you can in England. It will be useless for me to add that I have been obliged to proceed with the greatest economy, and to devote myself to the work charitably and gratuitously. The service (kitchens, &c.) are established in the underground story, on the front opposite to the present view. They are entirely above the level of the ground, which is there much lower. The ground floor contains the school and asylum-rooms, and other appurtenances. In the centre is the chapel allotted to the public. On each side of the nave is a gallery for the orphans. This chapel makes a separation for the different sexes. The first floor and the lofts contain large dormitories, and the buildings are disposed in such a manner as to allow the airing of the rooms, so as to keep them in a perfect state of salubrity, and without using artificial means. The communications are easy, and by means of corridors. The service is concentrated, and consequently simplified. The walls are built of brick and white stone, and the whole is roofed with slates. The establishment consists of 800 square metres; the cost amounts to 10,000 francs, or 100 francs a square metre—that makes £3 6s. 10d. the square yard. Just imagine a substantial orphanage to accommodate 300 children being built in England for less than £3,400!”



NEW TOWN HALL FOR WEST BROMWICH

THE SELECTED DESIGN

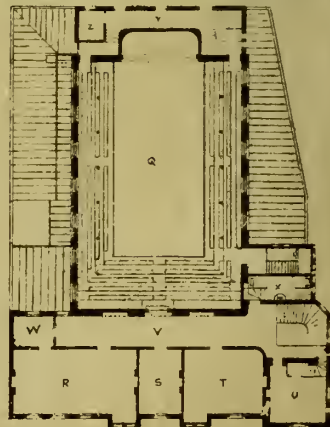
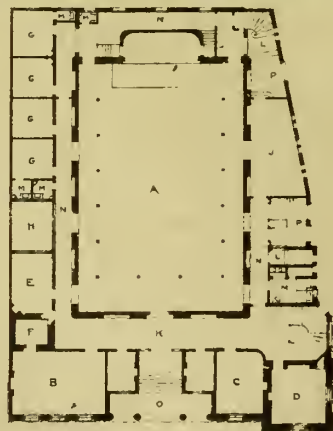
BY MESS^{RS} ALEXANDER AND HENMAN

REFERENCE TO THE PLANS

GROUND FLOOR PLAN

A TOWN HALL
B SURVEYOR'S OFFICE
C INSPECTOR OF NUISANCES
D SVB CLERK'S OFFICE
E RATE COLLECTOR
F M V N I M E N T R O O M
G R E T I R I N G R O O M S
H O P E N A R E A
J W A I T I N G R O O M
K C O R R I D O R
L S T A I R S T O G A L L E R I E S
M L A V A T O R I E S W C ' S E T C

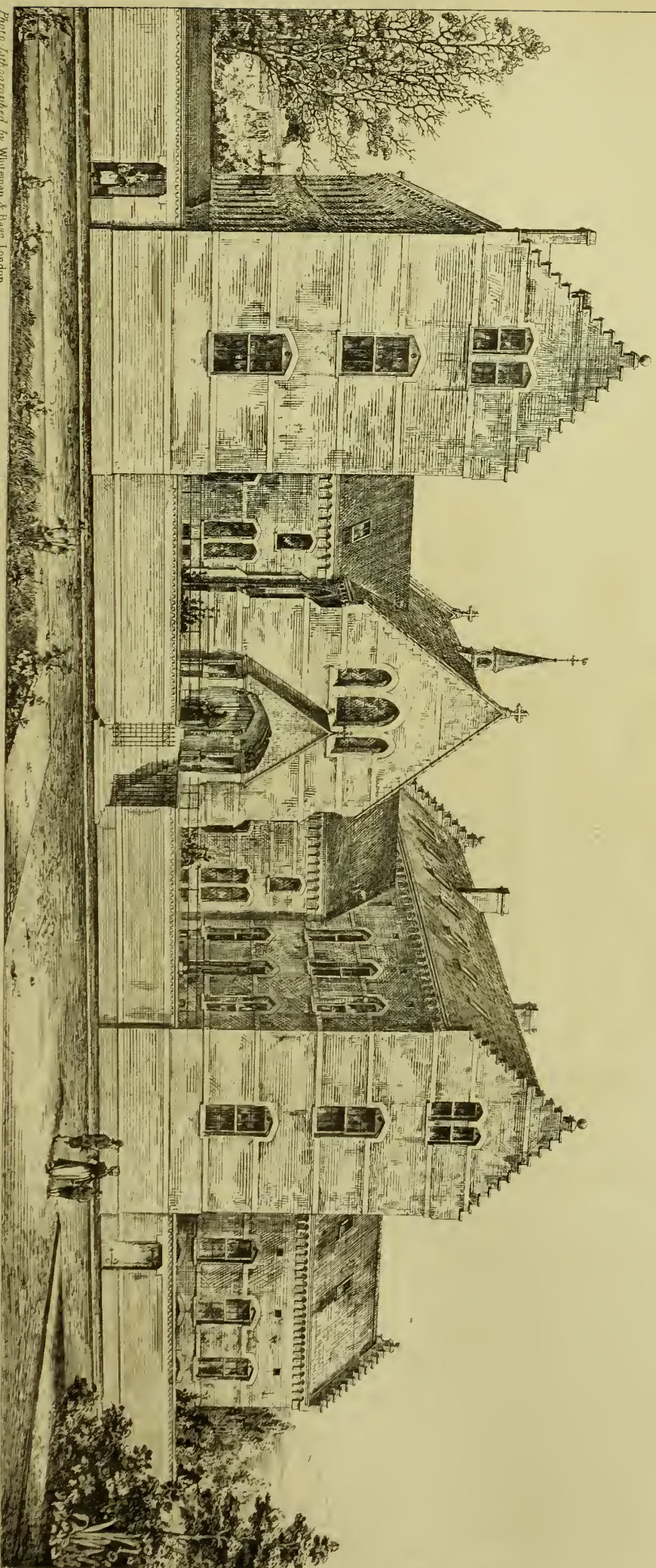
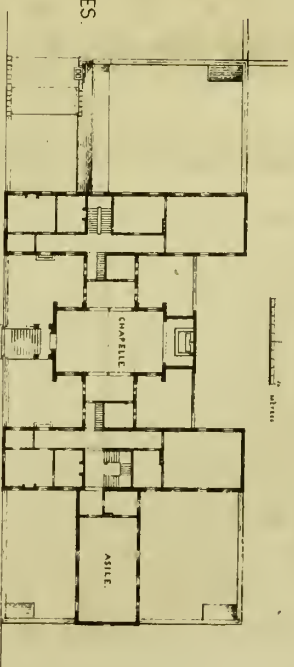
N P A S S A G E S
O P R I N C I P A L E N T R A N C E
P E N T R A N C E S T O H A L L
Q U P P E R P A R T O F H A L L
R B O A R D R O O M
S C L E R K S ' O F F I C E
T C O M M I T T E E R O O M
U S P A R E R O O M V C O R R I D O R
W R E T I R I N G R O O M
X L A V A T O R Y W C ' S E T C
Y P A S S A G E T O G A L L E R I E S
Z C L O A K R O O M





ORPHELINAT S. JOSEPH.
A SCHAEERBEEK - BRUXELLES.
ÉRIGÉ PAR LA CHARITÉ PRIVÉE POUR 300 ENFANTS PAUVRES.

E. CARPENTIER ARCHTÉ
A BELCEIL (HAINAUT) 1869.



CHURCHES WITH WIDE NAVES.

AMONGST the forms of plan which have been recently tried, in the endeavour to adapt Mediæval church architecture to modern purposes, that of which the essence is an exceptionally wide nave deserves to be noticed. Mr. Street has recently finished a church of this class at Clifton. Mr. Hansom is now finishing another at Manchester, and the type is likely to spread further. It is, of course, not a new one, though it has never been common in this country; and, while its advantages for the use of a congregation are obvious, there are considerable difficulties in the way of its practical adoption. The chief of these seems to be the difficulty of retaining, either inside or outside, sufficiently lofty proportions. This, it is true, is mainly a question of money. Given sufficient funds, nothing prevents us from raising the walls as we widen the span; till the ridge of the roof, instead of being fifty or sixty feet above the floor, as usual, may be, as in some Continental examples of the kind, between one and two hundred. So lofty a nave must evidently be an expensive one, and a system of very wide spans is not, therefore, the most promising for ordinary purposes. Up, perhaps, to a limit of thirty-five or forty feet it may often be useful; beyond that, it will prove costly if it be properly carried out. Even supposing, however, that the question of general height has been satisfactorily settled; supposing that we can afford to make the side walls perhaps twice as lofty as usual, increasing their strength at the same time as the rules of construction demand, the wide roof will still give us some trouble. On a large building, indeed, a large surface of lead, or even of slating, may look very well. No one, probably, would wish the roofs of Lincoln Cathedral to be smaller than they are; but the case of a cathedral is very different from that of a parish or district church. The amount of roof which suits the one will dwarf the other; the mass which a first-rate building can carry with apparent ease will seem to crush a small one to the earth. Two of the first questions which suggest themselves, then, about any church with a specially wide nave are these:—"What means are used, either internally or externally, to prevent undue lowness of proportion?" and "How is the crushing effect of a wide roof avoided?" We have made at different times some memoranda bearing on these points, as they are illustrated by a variety of churches, old and new, English and Continental, and we offer them to those of our readers who may feel an interest in the matter, premising that the dimensions are in round numbers, and do not pretend to great exactness.

Taking the dimension, then, across the nave, from centre to centre of the nave piers, a large proportion of English works will be found under thirty feet. Cathedrals and abbey churches, of course, exceed it; Lichfield measures about thirty-three feet, Hereford and Chichester about thirty-seven feet, and York thirty-nine or forty feet. Amongst the multitude of moderate-sized churches which have been built of late years, twenty-five feet is probably not far from the average. Mr. Street's narrow-aisled church (S. Philip and S. James) at Oxford measures about thirty feet, and Mr. Brooks's S. Columba's, if we remember rightly, a foot more. Mr. Hansom's new Catholic Church at Manchester, before referred to, is nearer fifty than forty feet across the nave, and is lofty in proportion. This, however, is quite an exceptional work for England, and as usual we must turn to the Continent for examples showing largeness of scale. Here we may find all dimensions, from the very smallest upwards, but the average, at least in France and Spain, is considerably greater than in our own country. S. Ived, Braine, for example, has a nave thirty-three feet wide from centre to centre of the columns; Notre Dame, Etampes, is one of the same size, and

S. Martin, Etampes, a foot wider. At S. Ived the roof generally is of a steep pitch, but some distance above the eaves it turns up into a much flatter one, and its visible surface is thus considerably reduced. The Church of Vilvorde has a forty feet nave, the height from floor to ridge of roof being about double this dimension. Soissons Cathedral is forty-three feet wide, measured in a similar way, and its height to the ridge is treble instead of double the width between the centres of the nave arcades. At S. Etienne Auxerre the dimension is forty-four feet; the roof is nearly equilateral in pitch, and the details throughout are large in scale. This latter fact is worth remarking. If, as in most of these wide-span churches, the general design cannot be prevented from shaping itself as a large and only slightly-diversified mass; if its natural tendency is towards the solid and substantial rather than the picturesque—we have still the option of making either the best or the worst of this tendency, by the way in which we treat the details. If they are large, bold, and emphatic, the work may become sublime; if they are small and frittered, it is certain to appear ridiculous. The early French architects have left us examples of the first treatment; and the chapel-builders of to-day are taking care that we shall not lack those of the second. With such examples more words would be wasted. In Germany, Fribourg Cathedral is comparatively narrow, being only thirty-six feet across the nave. S. Cross, Breslau, has a width of forty feet; the aisle walls are high, and the roof is partly hidden by those unsatisfactory side gables which are now caricatured at every street corner by the wholesale manufacturers of architectural trash. Lubeck Cathedral, which is as far as possible from being a model of external design, is also forty feet across the nave. Worms Cathedral is forty-four feet, the height to the ridge being about twice and two-thirds of the width from centre to centre of piers. S. Castor, Coblenz, has a thirty-nine feet nave, with the relatively moderate height of about seventy-eight feet from floor to ridge. But the two gabled ends are flanked by towers, which both narrow the elevations and draw up their lines; while the eastern one is in great part filled up by the apsidal choir which abuts against it. It is worth remarking that a gable end merely showing, as in this instance, above the lower roof of a choir rarely looks unpleasantly wide. The eye, in fact, does not easily perceive what its proportions are, and thus, if the west front can be prevented from looking too broad, the other end of the nave can be managed with no great difficulty. S. Mary's, Lubeck, is forty-eight feet wide, and its height (by which the measurement from floor to outside ridge is always here intended) is about three and one-third times as much. With such an altitude as this, little difficulty need exist in obtaining good proportions; but the more interesting cases are those in which a moderate height is skilfully made the most of. Ulm Cathedral has the height as three and one-sixth to the width, the latter being 56ft. Spires Cathedral is 51ft. across, and of somewhat lofty proportions; internally it measures 75ft. from the floor to the springing of the vault, and 30ft. more to its crown. Outside many of its roofs are hipped, and much horizontal character is introduced by cornices and arcades. It is noticeable that a wide building of a horizontal type looks sufficiently tall with far less actual height than a vertical one of the same size would require; nobody complains that the Parthenon is too low, and yet in an aspiring type of Gothic the same proportions would be intolerable. There seems to be a suggestion here as to the economical management of wide churches. It does not follow, indeed, that we should revert to Classic precedents, for in Pointed art we have a choice between these two opposite systems. There is the broad, simple hori-

zontal work of the twelfth and thirteenth centuries on the one hand; there is the frittered, exaggerated verticality of the fifteenth on the other. The one will help us to deal with these wide-span churches, while the other will only increase tenfold their natural difficulties. We must reserve our suggestions, however, for a future occasion, only remarking for the present that abundant examples remain of even wider naves than those yet referred to. Treves Cathedral has a width of sixty feet from centre to centre of columns. Florence Cathedral the same. Alby has an aisleless nave sixty-three feet across. S. Bertrand de Comminges a similar one of fifty feet, and the Cordeliers at Toulouse one of fifty-eight feet. In Spain, San Benito, Valladolid, has a forty-two feet nave. Salamanca Cathedral, Segovia Cathedral, and Santa Maria del Mar, Barcelona, each one of forty-five feet; Tarragona Cathedral, one of fifty-two feet; San Juan, Perpignan, and the Collegiate, Mauresa, sixty feet naves; and the Cathedral of Palma, in Mallorca, one of more than seventy-one feet. The list is enough to make us confess that we hardly seem to realise in this country what church-building is capable of; and that even now, with a form of worship in which the congregation is specially called upon to join, our churches are incomparably less fit for congregational use than those erected by the Catholics of Spain five hundred years ago.

ART TEACHINGS OF THE INTERNATIONAL EXHIBITION.—III.

BY OMICRON.

MOSAIC GLASS AND MISCELLANEOUS PAINTING.

IN the multitude of counsellors there is not always wisdom: the subdivision of labour may be carried to such an extent as to produce confusion and weakness. The proof of this position is painfully established on a consideration of the various reports in the Art section of the International Exhibition, sixteen in number, which abound in dogmatic assertion, repetition, and conflicting opinion, to an extent positively bewildering. It would occupy too much space and time to discuss in detail all the absurdities conspicuous in those productions; we must, therefore, restrict our attention to some of the more prominent. In two former articles under this head we passed in review Sir Coutts Lindsay's report on "Oil Painting," and Mr. S. Redgrave's report on "Painting in Water Colours." We will now proceed to pay our respects to the report of Sir Digby Wyatt on "Miscellaneous Painting," which he defines to be all painting "other than oil or water-colour," and to that of Mr. Gambier Parry, on "Mosaic and Glass Painting," which might more properly have been included under Sir Digby Wyatt's comprehensive title.

Sir Digby Wyatt, in the matter of miscellaneous painting, is a man of a single idea, but within the scope of that idea may be said to be, in a certain sense, a man of "enlarged views." His one idea is that painting is the handmaiden of architecture, its highest manifestations having "almost invariably assumed the form of association with structure." According to his view, a picture must be of large size, or it cannot be "sublime." The portability of modern pictures has been the ruin of high art, their size being "incompatible with the display of a great artist's power upon any large scale." According to this, the masterpieces of Francia, of Raphael, Correggio, Carracci, Guido, Rubens, Rembrandt, and others of the old masters which adorn our National Gallery and other great collections, are mistakes—the fruit of misapplied genius. "Great" art is dead amongst us; or, as we are informed in a rather cumbersome sentence: "Illustrations of other directions in which the artistic mind has been seeking outlets for the pent-up power which no doubt exists in this country, for the pro-

duction of historical paintings on a large scale, in the mural form, are *conspicuously absent* from the present exhibition." In answer to this, it will at once suggest itself that it was hardly to be expected of our artists that they should decorate the very walls of the International Exhibition with historical paintings, unless they were paid for them; and that such decoration of the walls, so far as it went, would render them unavailable for the purposes of an annual exhibition. Besides an isolated sample or two of historic art "in the mural form" would hardly satisfy Sir Digby; with him, painting to be grand must not only be on a large scale, but it must be applied to a "concatenation of ideas," or "well-ordered series of subjects all culminating in, or working towards, the illustration of some great truth or law, divine or human, or to the record of some noble drama, big with the fate of nations or of men." Big words these; but what do they mean? Have they, indeed, any possible practical import at the present day? We all admire and venerate the grand mural paintings which covered the walls of the early Christian church, and which continued to be produced in the form of a degenerate art during the whole period of the dark ages; we hail the nobler and more perfect productions of the like kind which engrossed the earlier efforts of the masters of the Renaissance period; but we acknowledge their claim to our admiration and our sympathies not only for their intrinsic artistic merit, but for the grand useful purpose which they fulfilled, of instructing the people in the truths of the Gospel, and keeping before their eyes the types emblematic of their creed. With the introduction of engraving and printing these mural books became unnecessary, and the requirements of modern society have not offered any other themes, whether pertaining to great truths of law, physic, or divinity, requiring mural illustration, whilst the drama of events "big with the fate of nations or of men" is amply and more conveniently traced in the columns of the daily paper or the volume of history.

In no country in the world would the practice of mural painting (other than for the purposes of mere ornamentation) be more inappropriate, more inconsistent with the genius of the people, than in England; and as regards the decoration of churches, this is especially true. The tone of public feeling from the date of the Reformation, and more particularly during the Protectorate, was entirely against the painting of churches as savouring of Popery and idolatry. The performances of Verrio and Laguerre, which graced the later days of William and Anne, and were the subjects of the well-known biting sarcasm of Pope, were of an essentially different type to those of the early church painters, and in themselves were not calculated to increase our interest in the practice of mural painting; and, passing over the occasional efforts of a long intervening period, what, let us ask, could be more signally to the discomfiture of visionary enthusiasts who would restrict high art to "the form of association with structure" than the lamentable display of subjects adorning the lobbies of the Palace of Westminster, in respect of which the only comfort is that, through the failure of materials, or other local conditions, they are fast falling to decay? We make this remark, be it observed, without any reference to the artistic merit, be it more or less, of the several performances; we are content to restrict our condemnation to the very subjects themselves, a "concatenation" of anecdotes of bygone and almost forgotten history, not one of which illustrates any "great truth or law, divine or human." As to the largest and most conspicuous of these unfortunate productions—namely, Maclise's "Trafalgar" and "Waterloo," they are an anachronism at a time when the whole purpose of those bloody victories has been repudiated and cast to the winds; and their location in the ante-

chamber of a senate-house, in the very gallery traversed by a peace-loving sovereign, is, to use the mildest terms, most inappropriate and unseemly. In the large interests of truth, consistency, and good-will to man, we are not sorry to hear from Mr. Gambier Parry that, though these pictures have only been finished a few years, "they are already rapidly perishing."

And this brings us to another, and perhaps the most discouraging part of the question, as to the limitation of high art to wall-painting. It is not enough that there should be subjects appropriate to, and demanding illustration on our walls (which we maintain we have not), and artists able and willing to do them justice in that form (who, we submit, are not amongst us)—we must also have the materials and appliances necessary to produce them with success, and under conditions of permanence equal to that of the structure they are intended to adorn. Now how stands the case in this respect? After repeated attempts, and numberless experiments, we apprehend that it is established that, whether from defect in the materials, or unskilfulness in their application, fresco, tempera, and encaustic painting are unsuitable to our damp and trying climate—perhaps, indeed, it would be sufficient to name fresco, which in the days of the Renaissance superseded all others in wall decoration. There remains only mosaic, or ceramic devices which have been introduced in aid or substitution of it.

Mr. Gambier Parry is pleasantly fluent in expatiating upon the merits and advantages of mosaic. He says that "England is assuredly the country for mosaic. We need its durability and its lustre." Of its durability, however, under our climate we have yet to be assured; whilst vitreous lustre, though it may serve to liven up the walls of an ill-lighted building, is not the exact quality which should predominate in a great work of painting. It is too much to say that "nothing can surpass the richness of its beauty"—much too much to say that "its resources are unbounded." It was the very restricted nature of its resources which caused mosaic work to fall into disuse when high art revived. Would it be fair to assume the corollary that it will rise and flourish again upon a degraded art? Will so-called "painting" again become under its auspices a matter of manufacture and trade, as it was in the dark ages to which it gave what Mr. Parry calls "lustre"?

Let us not be suspected of irreverence when we would only award to everything its due meed of honour. Mosaic, in its origin a purely mechanical contrivance of putting together small cubes of stone, terra-cotta, and pieces of vitrified substances of various colours, was an invention of the gorgeous Alexandrine age, when the poetry of Grecian art began to give way to sumptuous glitter. In the first instance it was only used for pavements, and represented only inanimate objects. Under the Romans, who took it from Greece, it was chiefly confined to the same purpose, it being doubtful as to the date, and the extent to which under the emperors it was employed for wall decoration; but its resources were never, even in the ablest and most painstaking hands, found to be "unbounded." As Lübke, in his "History of Art," (I., 315) expresses it (and this was a necessity resulting from the very nature of the materials):—"The more delicate lines of the body, the more tender shades of expression, lay not within the range of its capability." The same writer gives the story of the rise, decline, and fall of this method of representation, as applied to early Christian art, in such a terse and telling manner that we cannot do better than adopt his language. "Early Christian art," he says, "could easily dispense with the charm of physical grace and the deeper expressions of feeling. What it needed were grand powerful characteristics, strongly-expressed types of sacred personages, which should express

themselves forcibly at a distance, and fill the mind of the spectator with pious reverence. Mosaic work, apart from its greater durability and monumental firmness, was sufficiently adapted to this; indeed, its very clumsiness was more likely to cause that the types once obtained should be adhered to without wavering, and formed into a fixed canon." It would be an interesting story, but too long to tell here, how, thanks to mosaic, art maintained its position during the worst period of the decline of the Western Empire, only marked by an increasing want of spirit, the figures ever becoming more lifeless and dull, and how, towards the fifth century, Byzantium became the head school of art, and gave laws and models to the rest of the world. These models, every day degenerating in type, departing more and more widely from nature, became at length mere conventionalities, more and more simple and meagre in outline, which the mechanic copyist the more easily followed in proportion as they became flatter and more unreal. Very generally, after the ninth century, Constantinople had to supply Italy with the workmen, as well as the models, when a decorated building was required.

On the partial revival of art in Italy in the middle ages, under Romanesque influences, mosaic still continued to be used, but now partially, and progressively, more and more freed from the thrall of Byzantine types. In the more advanced development which commenced in the thirteenth century, the same old process was resorted to, and, when applied by a master hand, with astounding results; witness, amongst others, the famed "Navicella," executed partly from the design of Giotto, in the vestibule of S. Peter's at Rome. It was towards the close of the fourteenth century that fresco—damp fresco—came into use, and from that time, in face of the superior opportunities which that process afforded to the master hand, to say nothing of its greater economy, mosaic began to fall into disuse. A remarkable illustration of how completely fresco superseded mosaic, even on its own territory, whence it had so long given the law to the rest of the world, is given by Didron, the French archaeologist, who made researches in 1839 into the state of painting in Greece, Thessaly, and Macedonia. He reports that mosaic, owing to its great costliness, was then seldom or never heard of; whilst the incredible number of frescoes he met with was matter of astonishment to him. All the churches were filled with paintings of this kind; but, true to old precedents, the various subjects were frequently repeated in many churches without any change. At Mount Athos, where there were 935 churches, chapels, and oratories, all filled with frescoes, he had an opportunity in one of the monasteries of witnessing the excessively rapid and easy mode in which such works were produced, the monk Joseph, with five assistants, having painted a Christ and eleven apostles, the size of life, before his eyes within the space of an hour.

In face of such experience as we have thus briefly pointed to, it may be well to pause and reflect whether, in the impossibility of employing fresco, even with the aid of water-glass for wall decoration, it would be worth while, or consistent with the character of a remarkably creative age, to revert to the effete art of mosaic; or, even if it were held to be desirable, whether it would be feasible to obtain the necessary talent for its application. To discuss the subject with completeness it would be necessary to take into account the several ceramic appliances of recent invention, intended to assist in realising or paraphrasing the principle of mosaic painting. But we must break off for the present.

A detachment of the Royal Engineers arrived at Llantrissant last week for the purpose of commencing the Ordnance survey of the county of Glamorgan.

ON TERRA-COTTA, BRICKS, AND ENCAUSTIC AND OTHER TILES.

By GILBERT R. REDGRAVE, ESQ.

(Continued from page 265.)

WE do not find anything among Mr. James Pulham's contributions to beat the Mulready monument he exhibited at the Paris Exhibition in 1867. He shows this time a goodly collection of vases and ornaments, an excellent window, and a well-designed cornice, in which some red terra-cotta is introduced with very good effect. He has also some fluted columns and ashlar work, a pier or gatepost, in which bands of red and white ware are used alternately. A well-modelled fountain, and numerous smaller objects, serve to show for what a variety of purposes this material can be employed.

The Watcombe Terra-cotta Clay Company also send specimens of their beautiful material treated in all sorts of ways—made into vases and busts, trusses and balusters, and the most delicate flowers and basket-work, many of which deserve the first place in point of quality and excellence. We do not quite like the colour of this clay, but in this respect all red clay nearly is alike. It is rare indeed to find a clay which will burn to a deep plum colour, such as the Fareham brick, and burn hard at the same time. The Watcombe clay is some of it not enough burnt; the point of a knife will scratch it, which is not the case with the foreign red terra-cotta. We invariably pronounce ware which will not stand this test unsuitable for out-of-door use. There is no doubt, however, that this clay is beautiful in texture, and perhaps with a little more firing it would satisfy us on this other point: the surface of some of the balusters and turned work seems almost polished, it is so close grained and satin-like in appearance.

The only other prominent exhibitors of red terra-cotta are Messrs. E. March and Sons, of Berlin, and Signor Boni, of Milan. The former firm sends numerous specimens both of the white and red material. The red terra-cotta has been extensively used in Berlin, as is proved by the large collection they show here of photographs of executed works, and the colour and quality are decidedly better than most of the red ware which has come under our notice. We are not certain that Signor Boni's red terra-cotta will stand well out of doors; some of it was already decaying fast when we were in Milan a year or two ago. He exhibits this time only statuary, and, therefore, his goods hardly come into our province, which is also the case with the objects sent by Messrs. Lindsay & Anderson. The ware seems fairly well burned, and is very uniform in colour, even in the largest pieces.

Messrs. Gibbs & Canning, of Tamworth, do not make a large display. We presume that they consider that the Arcades of the Gardens and the Royal Albert Hall will show what they are capable of. The tint of their goods is extremely pleasant, and they exhibit several specimens of enamelled terra-cotta or Della Robbia ware, which promises well as a cheap substitute for majolica. They send also some hollow hexagonal blocks for filling in the spandrels of vaulting, which seem good. They were designed some years ago by Mr. Hansom, and are now being largely used at Manchester.

Some of the best terra-cotta in the Exhibition, both in colour and manufacture, is that shown by M. V. Brausevetter, of Wagram, Austria. Particularly good is a Roman Ionic capital, and some mouldings, with Classic enrichment, exhibited by this firm.

Mr. J. Knowles, of Wooden-Box, sends some rather coarsely made but useful Gothic tracery, and a large assortment of chimney-pots. These goods, made from the Derbyshire fire-clay, have received rather more firing than much of the terra-cotta shown here.

Messrs. M. H. Blanchard & Co., of the Blackfriars-road, have also done so much work at South Kensington that they do not go out of their way to make a display in the Exhibition. They send a portion of the cornice for the Wedgwood Memorial Institute at Burslem, but it is mounted up so high that we could scarcely see it. The modelling is good, but the ware is all of one colour, and gave us rather the impression of having received a coat of distemper. The column modelled by Mr. Godfrey Sykes for the new Lecture Theatre at the South Kensington Museum, and shown by this firm, is an excellent example of vigorous work in this material; and the column for the Horticultural Arcade, and the two large blocks for the cornices of the Science Schools, serve to show what good work is being done

at South Kensington towards establishing a proper treatment of terra-cotta.

Mr. W. J. Holland, of Llanelly, sends a number of trusses, balusters, and vases, which are most of them very bleached and colourless; he has, however, some very commendable diapered blocks, made in pieces of about a foot square, which would serve as an agreeable substitute for plastering.

Messrs. Standing & Marten have here some arch blocks, and a string-course of no particular merit.

Mr. G. Smith, of Coalville, makes a great show of his so-called glypto terra-cotta, which is very bilious in colour, and seems to have had all its surface scraped off. His mouldings and shafts are, however, wonderfully true and accurate in shape, and very like stone, which is evidently all that he aims at; we have already pointed out the errors of manufacturers in this respect, and we need not again repeat our views upon the subject. Mr. Smith's ware is so coarse-grained in texture that we are convinced that it could not fail to retain the soot and dirt, and would get discoloured as fast as the most porous kinds of stone.

Mr. C. J. C. Bailey, of Fulham, sends a few specimens of what he calls porous ware, and some gas stoves of terra-cotta; the advantages he claims for such stoves is, that after the fire-clay of which they are mainly composed has once got well heated, it will radiate much more warmth than a small metal stove.

The display of bricks is unusually good, and the trade is very fairly represented. Both in colour and quality the specimens shown by Messrs. R. & N. Norman, of St. John's, Hurstpierpoint, deserve our highest praise; the designs are good, and the bricks evenly burnt and uniform in tint. We must particularly commend a piece of tracery, a portion of an enriched moulding, and some arch bricks exhibited by them, and point out the rich plum colour of the first-mentioned objects as specially worthy of imitation by those engaged in the manufacture of red ware.

Mr. George Gunton, of Cossey, near Norwich, has some capital red bricks, likewise very rich in colour and admirably moulded. He exhibits an entire chimney shaft of brickwork of an interlacing pattern, several varieties of chimney bricks, some panels of large size in red clay, an excellent balustrade in white clay, and a smaller one in red. This material seems particularly suitable for moulded work.

The gault clay is made use of by Mr. Pether for his patent diaper bricks; the idea of stamping on the face of the brick a pattern, or a portion of a pattern so arranged, that in building up the work in ordinary bond the bricks may work together into a simple diaper is an excellent one, and has been well carried out by Mr. Pether. We have here numerous designs which need only be regarded as suggestive of what may be done, for we understand that the firm will make any pattern which may be desired. The Burham Company exhibit, near the Brick Machinery Annexe, an arch of these patent bricks, which has a very good effect. They can make them both in white and red, but the latter colour is capable of improvement; in fact, all the colours shown are dingy, owing to the difficulty there is in staining so strong a clay as the gault.

The Suffolk whites differ essentially from the gault bricks, in having a much larger admixture of siliceous matter—of course, as both these kinds of brick are made from the clays of the cretaceous formation, the colouring matter in each case is chalk. In the case of the gault bricks the toughness and strength of the clay is not materially reduced before tempering by the use of sand, and the lime and silica being present in fusible proportions, tend in firing to partially vitrify the body; these bricks are, therefore, extremely hard, and at the same time brittle and difficult to cut. The Suffolk bricks, on the other hand, are so opened-grained and full of sand that they can readily be carved and rubbed into any requisite form, and are on this account in great demand for rubbers. The quantity of sand in a Suffolk brick is sometimes so great that one wonders how they can hold together with so small a proportion of cementing material, but from the fact that the Suffolk bricks undoubtedly harden in the course of time in the work, it is possible that some of the clay may combine gradually with the lime to form silicates in the wet way, and thus join the particles of sand.

We may mention here that the impure red clays of the Nottingham and Leicester district, which contain large proportions of carbonate of lime, and in some cases sulphate of lime, present in the form of crystals of selenite, frequently occasion great difficulties to brickmakers, owing to the imperfect distribution of this lime through the mass in the process of tempering. Unless the lumps of limestone

or the crystals are thoroughly broken up and intermingled with the clay, we get in both cases materials in the burnt brick which, on the addition of water, swell up and heat, and occasionally cause the disruption of the entire mass. Some good serviceable red bricks, however, from this district, exhibited by Mr. G. Tucker, of Loughborough, are free from this defect.

A wonderfully tough and durable brick is made from the gault, which, owing to the density of the clay, however, is apt to be rather weighty. This has been in some cases overcome by making a large frog or filling the brick with small perforations. The latter plan increases the adhesion of the joints and reduces the weight, without materially impairing the strength of the brick, and might, we think, be adopted with advantage in the case of all tough and dense clays. Gault bricks are shown by the Medway Gault Brick Company and the Burham Company.

The Suffolk makers have a fair show. The white rubbers fully maintain their high reputation. The red Suffolk bricks are almost without exception dingy and dirty in colour. The chief makers of Suffolk bricks or bricks of similar quality who have contributed to this exhibition are—the Great Northern Brick Company, Arnsley, Beds; Messrs. E. & E. C. Gibbons, of Ipswich; and Messrs. Wheeler Bros., of Coley Kilns.

Mr. B. Looker, of Kingston, has some capital moulded bricks and arch bricks of various colours, and some ingenious arrangements of tiles for the formation of simple forcing frames and glass covers for flowers and vegetables. By combining notched or grooved tiles and glass he provides, at a trifling cost, a means of protecting delicate plants from the weather, and puts it within the power of the humblest cottage gardener to cultivate those less hardy fruits and vegetables which have hitherto been confined to the gardens of the wealthy. He has a large show of different varieties of his frames in an extemporised garden near the Brick Machinery Annexe. Forcing frames, somewhat similar in construction, are also sent by Mr. W. E. Rendle.

Terra-cotta bricks, of good quality and of several stained colours, are shown by Mr. Davison, of Egton, Yorkshire, and admirable facing bricks of glypto terra-cotta by Mr. George Smith, of Coalville.

Much as we admire it, we cannot help considering rubbed brickwork to be false in principle. There is no doubt that rubbing has been resorted to in some of the most beautiful work which we possess; and we must admit the new buildings at South Kensington are most excellent examples of the judicious employment of red bricks. But we are convinced that as bricks are necessarily moulded in the process of manufacture, it is a mistake to tamper with and shape them after they leave the kiln. It is really doing the work twice over to cut them into fantastic shapes, as has been done in the window shown by Mr. Wm. Cawte, of Fareham, when they might have received these forms in a quarter of the time while the clay was in the plastic state. Besides, mortar joints are on no account to be despised, and "improved" down to the thickness of a mere sheet of paper, as we see here. We should say, by all means use the brick with the natural surface it receives in firing, and give it a plain, honest bed of mortar. This has been done in the Albert Hall and in the new Exhibition buildings, and we venture to assert that the effect with gray mortar is better than the rubbed work at the Museum, which looks as if the joints had been ruled on with a drawing-pen. The colour of Mr. Cawte's bricks is admirable, and the work here shown, a small two-light window, with very heavy mouldings, is most excellent.

Enamelled or glazed bricks and tiles are shown by the Farnley Iron Company, Leeds, Messrs. J. Cliff & Son, of Wortley, near Leeds, and Messrs. John Hall & Co., of Stourbridge. Bricks of this kind are used for lining the walls of lighting-shafts, and for the interior of butchers' shops, dairies, and other places where great cleanliness is required. The white glaze is obtained in two ways by different makers. Some put over the clay a thin coating of white body, and protect this with a transparent fritted glaze, while others employ an opaque enamel-glaze, such as is used for majolica ware. With some fire-clays there is considerable difficulty in causing the adhesion of a white body, and glazed bricks thus made are apt to scale. We have frequently seen patches as large as a crown piece which have dropped off, leaving the yellow colour of the brick exposed. Both the Leeds firms show the glazed bricks in various colours, some of which are very effective. The Farnley Company have some salt-glazed bricks, which are very pleasant in tint, and would do well for lining stables. They send also some large glazed slabs. The bricks shown by Messrs. Hall are not

* From the Official Reports of the International Exhibition. Published by J. M. Johnson & Sons, 2, Castle-street, Holborn.

so good in colour as the rest. They appear to have been made by using a stained glaze over a white body. As a large piece of successfully-glazed terracotta we may mention Mr. Finch's bath, although it hardly comes within our province. These baths are made at Stonbridge, and are burnt in an ordinary brick-kiln, and coated with the white body and glaze, all in one firing. The colour and texture of the surface much resembles the white glazed bricks shown by Messrs. Hall.

The surface clays of Staffordshire are largely impregnated with iron, and advantage has been taken of this to produce the well-known blue ware which is chiefly made in this and the neighbouring counties. The production of this material from ferruginous clays depends principally on a nicety, or better a *trick* of firing, and though there are doubtless numerous beds of clay equally well adapted for the manufacture of blue bricks in other parts of the country, we are not aware that they are made except in this particular district. By burning the clays at moderate temperatures, in the presence of a plentiful supply of atmospheric air, a good hard red body is obtained; by carrying the heat slightly further, checking the in-draught into the oven or kiln of the air, and creating large volumes of smoke towards the latter part of the firing process, the iron in the clay is reduced from the condition of the red oxide to that of the magnetic or black oxide, and gives, when the operation is properly conducted, a beautiful blue silvery look to the goods. The knack of obtaining the blue colour in perfection is a secret of a few firemen, and the writer has on more than one occasion spent a whole night in learning the precise details. Suffice it here to say that the best results are obtained by bringing up the heat by what is called a series of "pinches," *i.e.*, letting the fires down very low in the "mouths," and then adding heavy charges of fuel. Unless the stoking of the kiln is very carefully managed, a dull, purple-blue, without a trace of lustre, is frequently attained, owing, doubtless, to a partial return of the iron to the condition of the peroxide; or the top and bottom of the kiln may blue at so long an interval apart, that in firing for the bottom after the top is finished, the tiles and lighter goods in the upper part may become partially fused, and run together, which is very readily done, as the blue clay is melted into a black slag at china biscuit heat; or, lastly, the kiln may get "stored up," *i.e.*, the flues and passages for the smoke left between the bricks may get completely choked with soot from the dense black smoke, in which case the fires will no longer draw and the work comes to a standstill. The only remedy we know of for this latter evil is to empty a few pailfuls of water down the chimneys, which is a very radical and generally effectual measure.

There appear to be only two exhibitors of blue ware at this Exhibition. Messrs. Peake, of Tunstall, call their goods *terro-metallic* ware. They show a collection of flooring and roofing tiles of first-rate quality, which have been very well fired. It is rarely that blue clays are discoloured in firing for more than one-eighth of an inch beneath the surface, but we see from a broken sample that this ware is blackened all through. The hardness of blue bricks and tiles and their consequent suitability for pavements is well known. If we remember rightly, Westminster Bridge was paved with blue quarries, which have now, however, lost every trace of their former colour.

Messrs. Doulton, from their works at Rowley Regis, also send some excellent samples of blue bricks, copings, and channel blocks, which are exceedingly true and well formed, owing to the use probably of metal moulds, and to the great care they have received in firing. Some of the tiles shown by other exhibitors have merely been coloured by an external coating of some metallic oxide, probably manganese, and we may add that by the use of an iron wash, a bastard blue brick is frequently made, which looks well for a time, but does not wear like the genuine blue goods.

The last few years have witnessed many new inventions with reference to concrete building, and the claims of rival patentees of the various machines which have been proposed for the purpose have been at times rather bewildering. We have in the Exhibition several ingenious contrivances for doing away altogether with machinery for concrete building. Thus Messrs. Parr & Strong show their patent combination, which consists of hexagonal tubes of terra-cotta filled either partially or entirely with concrete. By this means a wall, having a pleasant honey-combed appearance, is rapidly constructed without any apparatus, and the necessity for subsequent stuccoing is dispensed with. In the specimens shown we have, in the lower part, the tubes with a facing of stone which is thus protected from the damp, useful therefore for retaining walls,

while above them is a mode of using the tubes in combination with concrete-blocks, but the tubes may also be used alone without any backing whatever. The blocks in this case are made of Colonel Scott's patent selenitic mortar, and the cornice was worked by the Patent Stone Working and Tunnelling Machinery Company.

We have also here the facing for concrete walls invented by Mr. Taylor, of the Broomhall Company; this is a hollow terra-cotta tube, square in section, which, on being split diagonally, forms a couple of facing bricks: each course, when laid, serves as a receptacle for a fresh layer of concrete, the exterior of the wall resembling brickwork. The Broomhall Company also show the damp-proof course they have introduced, and Taylor's Patent Roofing Tiles, a cheap and light substitute for the ugly looking slates or heavy tiling in general use. To show the efficiency of their damp course, which differs from that of other makers in having a clear air-passage through each joint, the specimen of walling shown by the company is placed in a vessel of water. A small model is also exhibited of a method of making and laying tiles whereby a continuous air-space is formed under each tile.

There is not a very great show of roofing tiles, but we have no fear that this class of goods is falling into abeyance. For a long time the cheapness and lightness of slate, and the increasing facilities for its transport, bid fair to extinguish the tile trade; but, now that people have experienced the advantages of slate and its discomforts, they are coming round to tiles again, and manufacturers are trying to give us something better than the old-fashioned pan or plain tile.

Foremost in the excellence of their goods are Messrs. Colthurst, Symons, & Co., of Bridgewater, whose corrugated roofing tile has a very neat appearance, and seems well made. This firm shows a large assortment of ridge, cresting, and other ornamental tiles, some of which are stained black with a manganese wash, and have a semi-vitreous glaze. The Broomhall Company have the tiles we have previously mentioned, invented by Mr. Taylor, which can be made in various colours; and some good, serviceable tiles are sent by Messrs. Major, of Bridgewater.

The show of encaustic and decorative floor and wall-tiles in the present exhibition is most complete, and constitutes one of the most interesting features in the ceramic department. Few could have foreseen, when Mr. Herbert Minton perfected Prosser's patent for compressing clay-powder, what an important branch of the trade this would eventually become, and what a large demand would arise in the course of a few years for the so-called encaustic tiles. The art of making inlaid tiles is by no means one of modern origin, as all who have examined our old cathedrals and churches will at once remember. Indeed, in the hands of Mediæval artists, it was brought to great perfection, and the floor-tiles of the thirteenth and fourteenth centuries still remain in many of our ancient buildings in a fair state of preservation. One of the most important of the new manufactories recently erected at Stoke-upon-Trent has been built for the production of encaustic tiles, and we are assured that the numbers used in this country and exported abroad are enormous.

We fail to find an exact definition for the term "encaustic," but we take it to apply to such materials as have their colours actually incorporated with the clay, and burnt in at the same time as the body of the ware. All the encaustic tiles are made from red and white clays or stained bodies, and the colours which are employed to decorate them are applied in the condition of liquid slip, or, when made from dust, in the form of a coloured powder. The so-called majolica tiles differ from the encaustic tiles in having their colour applied in the form of an enamel or coloured opaque glaze. They have not, therefore, the same amount of durability, and are only used for walls and similar ornamental purposes. A class of pseudo-encaustic tiles is now being largely made in which the colour which should be burnt in along with the clay is merely applied as a transfer printed pattern on the surface. Such tiles are frequently coated in the gloss-oven with a transparent fritted glaze, and serve for flower-boxes, wall-tiles, and such-like purposes. To give them the appearance of having true inlaid colours, the edges of these tiles have frequently a little colour applied to them to represent the depth of the insertion of the coloured clay.

Messrs. Minton, Hollins & Company, of Stoke-upon-Trent, are foremost in the number and excellence of their goods. A branch of the art of tile making, to which they paid great attention, is the preparation of tesserae for mosaic work, made in the same way as dust tiles, only on a much smaller scale. A noble specimen of mosaic work in this

material is the frieze which surrounds the Royal Albert Hall. In this frieze the average size of the tesserae employed is about half-an-inch square, and the surface covered is over 5,000 square feet. The ordinary flooring tiles, as used in the Exhibition, are made from powdered clay, which is prepared from slipped, dried, and ground clay put into steel moulds, and consolidated by means of a very heavy blow in a screw-press, much after the fashion of a coining press. Messrs. Minton send some decorated earthenware panels, stoves, and fire-places, and some well-designed majolica wall-tiles. Their encaustic tiles require no praise from us, as the name of Minton is deservedly famed throughout the world for this class of goods. In the upper arcade are some admirable wall tiles, made by stamping an impressed pattern on the surface of the tile, and then filling in the depression with colour.

Perhaps the most attractive display in structural ceramic work is made by Messrs. W. B. Simpson & Sons, who have produced numerous most suggestive designs in what they have called art-tile work. A staircase, handrail, and balustrade, and adjacent wall-decoration by this firm, is an admirably worked out and most effective scheme for the employment of tile work and majolica. They send also some chimney-pieces enriched with tile inlays and painted tiles, and some most commendable wall diapers and soberly-tinted specimens of majolica tile-work. Some excellent glass and other mosaics are shown by Messrs. Simpson, notably a *redos*, subject, "The Lord's Supper," and a portion of the mosaic decoration for St. Paul's Cathedral.

Some very well-designed tiles, and some novel and effective combinations and patterns, are contributed by Mr. R. Minton Taylor, of Fenton Tile Works.

Messrs. G. Maw & Co. also make a strong show of embossed wall-tiles and majolica ceramic decorations. Some of the enriched panels they send are very good both in colour and design. Especially good also are some small diaper patterns for mural decoration, some mosaic work, and some knobs and bosses for building into walls in order to obtain colour and relief.

The Architectural Tile Company exhibit their mosaic and tessellated pavements. We believe that this firm introduced the idea of making tiles which represent a number of smaller ones joined together in the form of mosaic work. This, as a fancy, is all very well, but we do not quite recognise the correctness of the principle on which it is founded, nor do we like their tiles representing inlaid marbles and mosaic work, which are too much like floor-cloth to please us.

Messrs. Minton & Co. exhibit decorated tiles in imitation of encaustic tiles, for mural decoration, and some admirably-painted earthenware slabs. Messrs. Heaton, Butler, & Bayne send some quaint and prettily-designed tiles, illustrating fairy tales. Messrs. Whetstone show some flooring tiles of good quality and design, but rather poor in colour.

The show of tiles from foreign countries is very poor. Some curious Portuguese wall-tiles are lent by Mr. G. Maw; these are, most of them, of the character of our enamelled majolica tiles, being first rudely modelled, and then coated with an opaque enamel colour. In some cases a series of plain tiles are put together to form pictures.

The Indian Court contains some most interesting tiles, slabs, and roofing tiles, which are not yet fully arranged, but which afford excellent examples of the use of richly coloured glazes over common clays.

We do not find any exhibitors in this class who come forward on the score of cheapness, and we would suggest to our manufacturers the advisability of giving us some more roughly-made tiles suitable for the cottages of the poor. The admirable tiles which are made in India, and sold at an amazingly small price, should encourage Englishmen, with the machinery and appliances they now possess, to give us something better than the cold and cheerless stone flagging, or the soft, damp, brick paving which is too frequently the only material which can be obtained for the floors of the labourer. We have now arrived at so much perfection in tile-making that we are not likely to see any further improvements of much importance. Now let our manufacturers turn back and see what they can do in another direction. Of course we are aware that tiles may be had at a couple of shillings per square yard, but these are badly-shaped, ill-looking articles, and we want something better than this.

We cannot terminate this report without expressing our strong conviction that, as far as the manipulative processes are concerned, our terra-cotta and tile manufacturers have little to learn; what they now want is more originality and art power in the designs for their productions.

THE CANADIAN S. PETER'S.

A MONTREAL journal gives some particulars of a new (Roman) Catholic Cathedral now erecting in that city destined to eclipse all existing ecclesiastical structures on the American Continent. Nineteen years since the cathedral and palace of the Bishop were destroyed; Monseigneur Bourget at once set about preparing to rebuild it, and chose for his model S. Peter's at Rome. Accordingly, about the middle of the year 1869, the Rev. Joseph Michaud, of the congregation of S. Victoire, an amateur architect, entirely self-instructed, was sent to Rome to make plans and drawings of S. Peter's, and to prepare a model in wood of the edifice which was to be. The model, which is now in the possession of the Bishop, is said to be in itself a work of art.

Having acquired the above much-needed information, the bishop at once began the work of building, and rather more than a year ago the foundation-stone was laid. The main building, from the entrance to the farthest extremity, is 300 feet long; the greatest breadth, which is at the transept, is 225 feet, while the average width is about 180 feet. To be added to the length, however, is the portico, which gives 30 feet more. The building is cruciform in shape. The average height of the walls will be 28 feet from the bottom course; at the transept and at the bases of the minor domes they will be 50 feet in height, while the apex of the main roof will reach a height of 80 feet.

The main dome will rise from the transept, being supported on four oblong columns, 30 feet thick, and will, when completed with lantern, ball, and cross, reach a height of 250 feet. This dome will be built of stone, and will be the only one of the kind on this continent. Its diameter on the inside will be 70 feet, and outside 98 feet. It will, except in size, be an exact copy of St. Peter's. Just above its junction with the roof it will be surrounded with sixteen sets of Corinthian pillars about 24 feet in height, surmounted by pilasters, the spaces between the pillars being occupied by large windows, with highly-ornamented sills and cornices. Above this the dome gradually bends to its apex, from which rises the large open-lantern. Like the dome, the lantern is surrounded with pillars, though of lesser magnitude. Above the lantern is the great ball, and at last the gilt cross, 12 feet in height. About half way in the descent to earth will be four smaller domes, surrounding the great one in the centre. They will be in everything but size almost exact copies of the one just described. A portion of the building as yet unmentioned is the portico. This will not be finished, nor will it probably be begun for several years to come. It will extend 30 feet beyond the main walls, and will rise to the height very nearly of the main roof, or about 75 feet; its length will be about 210 feet. Unlike the church proper, the walls of which are exceedingly plain, being built of ncut limestone and devoid of the slightest ornament, the façade of the portico will be of cut stone, and finished in that rich composite order of architecture which allows of a very great variety of ornamentation. There are to be five entrances to the vestibule, which is to be about 200 ft. long, from 18 ft. to 20ft. wide, and 40ft. to 45ft. high. The walls of the main building are, at their base, about 10ft. thick, and will vary at the top from 4ft. to 6ft. On entering the church there is an unobstructed view down the nave, which is 40ft. wide, to the grand altar, situated under the great dome. On either hand are large pillars supporting the roof, and dividing the aisles from the nave; at each pillar two chapels will be placed, so that in the church there will be, besides the grand altar, about twenty chapels. The immense pillars (four in number) which are to support the dome, will rise from the transept, their shape will be rather oblong than square, and their greatest diameter 30ft. A good idea of their size may be formed when it is stated that at each pillar will be three altars, or chapels. Light will be furnished exclusively by the five domes and six lanterns placed in the roof.

LIVERPOOL ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.

THE second meeting of the session of this society was held on Wednesday week at the Royal Institution, Mr. H. H. Vale, the president, in the chair. It was announced that the prize for an "Architectural Sketch Book," consisting of sketches taken during the recess, was awarded to "Vérité," the author being Mr. Lowdon, employed in Mr. Weightman's office. The chairman said he felt sure the members would sympathise with him in expressing their deep regret at the death of the late Mr. James Holme, for many years a member of the society. Speaking of the high sense entertained of

the character of the late Mr. Holme, the chairman remarked that, more particularly in connection with cases of arbitration, he was always distinguished for his patience, honesty, and candour, and his careful painstaking way was an example for any young man to follow. He (the chairman) thought it was their duty publicly to express their sense of the loss they had sustained in the death of the deceased. The members then proceeded to a discussion on professional charges, pursuant to a resolution passed at the recent conference of architects held in London. A request had been made that the views of the society should be forwarded, as it was intended to draw up a code of rules for charging which could be recommended for general adoption. After some discussion, a resolution was adopted that in those branches of the programme in which a different local usage is firmly established the profession in that locality was at liberty to conform to that usage.

SURVEYORS' FEES UNDER THE ECCLESIASTICAL DILAPIDATIONS ACT.

A MEETING of the Archdeacons and Rural Deans of the diocese of Winchester, was held at Winchester House, S. James's-square, under the presidency of the bishop, on Wednesday, the 18th inst., to determine upon the scale of fees to be charged by the surveyor appointed under the Ecclesiastical Dilapidations Act. Subjoined is the table of fees agreed to.

Sections of the act referred to.	£	s.	d.
12 to 15. For work required, together with report and one copy of the same.....	5	5	0
29 to 31. For other copies of the report and sending the same, per folio.....	0	0	4
(The specifying in detail required by the act is to be sufficiently explanatory to enable a trustworthy contractor to estimate for the execution of the work in all ordinary cases of repair, or to enable an architect after personal inspection of the premises to prepare full specifications and instructions necessary for contractors to tender upon.)			
22. If the repairs are found sufficient.....	2	2	0
(If the repairs are found insufficient, the report made is to be tantamount to one made under section 15, and is to be charged at a like rate.)			
44. For each certificate.....	2	2	0
45. For the work done under this section, 5 per cent. on the outlay with a minimum fee of £5 5s. This charge is to include all certificates under sections 44 and 46.			
46. For certificate in triplicate and sending the same.....	2	2	0
50 and 51. For certificate, making and sending copies.....	2	2	0
52. For certificate.....	0	10	6
But if personal inspection of the premises be required.....			
57. For survey and report, together with certificate in triplicate, as under sections 14 and 15.	2	2	0
For certificates for the payment of money during the progress of the works, as under sections 44 and 46.			
58 and 59. The work done under this section not to be charged for separately.			
70. For advising the bishop as to consent, if employed, and if no inspection of the building is necessary.....	1	1	0
If inspection is necessary, according to the amount of work.....			
71. The same as under section 70.	1	1	0
For expenses of travelling in all cases actually disbursed.....			
	3	3	0

ECCLESIASTICAL DILAPIDATIONS ACT.

THE following appointments under this Act are announced:—

CHICHESTER.—Mr. Lacy W. Ridge, of 23, Bedford-row, London, W.C., has been appointed surveyor under the above Act for the diocese of Chichester.

ELY.—Mr. Day, of Bedford, and Mr. Fawcett, and Mr. R. R. Rowe, of Cambridge, have been appointed surveyors under the Ecclesiastical Dilapidations Act, 1871, for the diocese of Ely. The diocese comprises four counties, and has been divided into three districts, with a surveyor to each.

OXON.—Mr. Edward G. Bruton, F.R.I.B.A., of Oxford, has been appointed surveyor to this diocese, under the "Ecclesiastical Dilapidations Act, 1871." Mr. Bruton is known as having published a book on the state of the law before the passing of this Act, and is the author of a "Handy-book" on the new law. There were eleven candidates.

PETERBOROUGH.—The following gentlemen have been elected surveyors for the three districts of this diocese:—Mr. Edward Browning, of Stamford; Mr. T. G. Jackson, of London; Mr. C. A. Macaulay, of Leicester.

ARCHÆOLOGICAL.

ANCIENT SERPENT WORSHIP IN THE WEST.—Mr. John S. Phené, F.G.S., F.R.G.S., who, it will be remembered, has been engaged in archæological explorations throughout the country for some time, and has made several interesting discoveries, has just investigated a curious earthen mound in Glen Feochan, Argyleshire, referred to by him at the late meeting of the British Association in Edinburgh as being in the form of a serpent or saurian. The mound is a most perfect one. The head is a large cairn, and the body of the earthen reptile 300 feet long; and in the centre of the head there were evidences, when he first visited it, of an altar having been placed there. The position with regard to Ben Cruachan is most remarkable. The three peaks are seen over the length of the reptile when a person is standing on the head or cairn. The shape can only be seen so as to be understood when looked down upon from an elevation, as the outline cannot be understood unless the whole of it can be seen. This is most perfect when the spectator is on the head of the animal form, or on the lofty rock to the west of it. This mound corresponds almost entirely with one 700 feet long in America, an account of which was lately published, after careful survey, by Mr. Squier. The altar towards the head in each case agrees. In the American mound three rivers (also objects of worship with the ancients) were evidently identified. The number three was a sacred number in all ancient mythologies. The sinuous windings and articulations of the vertebral spial arrangement are anatomically perfect in the Argyleshire mound. Beneath the cairn forming the head of the animal was found a megalithic chamber, in which was a quantity of charcoal and burned earth and charred nut-shells, a flint instrument beautifully and minutely serrated at the edge, and burned bones. The back or spine of the animal form, which, as already stated, is 300 feet long, was found beneath the peat moss to be formed by a careful adjustment of stones, the formation of which probably prevented the structure being obliterated by time and rain. Mr. Phené, who has also been investigating some chambered tumuli on the estate of the Duke of Argyll, at the instance of Lord Lorne, hopes that this curious and unique specimen of ancient worship may not be injured.

INTERESTING DISCOVERY AT BURY ST. EDMUNDS.—During the excavations now in progress in Bury churchyard by Mr. Watson, the workmen a few days since came upon twenty-three blocks of Purbeck marble, at a depth of about 4ft., and below the foundation of what used to be the taproom chimney of the Magpie Inn. Four of these blocks were partly worked into capitals, bearing ornamentation of perhaps the early part of the thirteenth century, the chisel-marks being as sharp as if made yesterday; and the other nineteen are, apparently, just as they came from the quarry.

THE ASHMOLEAN MUSEUM, OXFORD.—Mr. J. H. Parker, M.A., C.B., keeper of the Ashmolean Museum, proposes to give two lectures in the upper room of the museum on Tuesday and Wednesday, the 7th and 8th of November, and to exhibit the additions made to the collection during the last year. His first lecture will be on the additions and on the progress of the study of archæology during the same period, and its future prospects. His second lecture will be on the explorations and excavations in Rome during the same period, with suggestions for continuing them, and the probable results.

CHIPS.

In excavating for the foundations of the new church of S. Faith, Maidstone, a number of skeletons have just been found, and lying at the side of one was a leaden seal of a Papal bull of Pope Gregory XI., who was Pontiff from 1370 to 1378. The seal has been placed in the Charles Museum, Maidstone.

A Bernondsey "Steeple Jack" has written to the Governor of Strasbourg, proffering to take down the vexatious French flag that still flaunts defiantly from the flag-staff of the cathedral, defying the prowess of all who have yet striven to haul it down. He only asks for his travelling expenses to be paid, and will do the rest for the honour of the thing.

A new Corn-hall at Yarmouth, erected by Mr. J. Davoy, at a cost of £1,800, was opened on Wednesday week.

A new painted-glass window has recently been inserted at the east-end of Christ Church, Surbiton-hill. In the upper part of this window is depicted the Ascension, and in the lower part scenes of our Lord's life after his resurrection. In the south aisle there has also been placed a new window, the gift of Mr. Lavers (Lavers, Barrand, & Westlake), which has for its subject the Annunciation.

The Rev. Dr. Goulburn, Deau of Norwich, is engaged in preparing a work on his cathedral, its history and architecture.

Building Intelligence.

CHURCHES AND CHAPELS.

BATTERSEA.—S. Saviour's Church, Battersea Park, was consecrated last week by the Bishop of Winchester. The church is a well-proportioned building in the early French-Gothic style, and is capable of accommodating 700 people. The cost, including site, is £5,600. The architect is Mr. E. C. Robins, 16, Southampton-street, W.C.; and the builders, Messrs. Lathey, Battersea.

BURTON-ON-TRENT.—A new Wesleyan Chapel at Burton-on-Trent has been completed, from designs by E. Holmes, of Birmingham. Mr. D. Bassett, of Burton, was the builder. The style is of the Early Decorated period, and the plan of the chapel, which contains 845 sittings, is a parallelogram, being 51 ft. wide and 60 ft. in length on the ground floor, and 84 ft. in length on the gallery level, the galleries being recessed back over the entrance vestibule and vestries. There is a tower and spire which, together, reach the height of 120 ft. The spire is of Bath stone, relieved by Hollington stone bands. The cost was £2,365.

CIRENCESTER.—The chapels and other buildings in connection with the new cemetery at Cirencester have just been completed. They are from the designs of Messrs. Medland & Son, of Gloucester. The carving is by Mr. Boulton, of Cheltenham. The chapels are of local stone, with Bath stone dressings. The cost was about £2,500. Mr. W. Henton was the builder.

HANLEY.—The new chancel of S. John's Church, Hanley, was opened on Wednesday week. The chancel is built of brick and stone, and is of the Early Decorated period. The end is made apsidal for the reception of the altar, and the east window, which is of three lights, is filled in with painted glass from the window of the old chancel. Mr. W. Palmer, of Hanley, was the architect, and Mr. Matthews, of Hanley, the builder; while the tiles were from the works of Mr. Robert Minton Taylor, of Fenton. The total outlay on account of both chancel and organ will be about £900.

LEISTON.—The parish church of Leiston, Suffolk, was reopened on Sunday week, after considerable repairs to the roof and other parts of the fabric, which have been carried on by Mr. W. J. W. Lacey, of Norwich, under the superintendence of Mr. Frederick Peck, architect, of London. A new roof of Staffordshire tiles, lined with patent non-conducting felt, has been put up, the old hot-water apparatus substituted for a hot-air apparatus, and the floor paved with Staffordshire tiles.

LIGHTCLIFFE.—A new Congregational chapel has been completed at Lightcliffe, from the designs of Messrs. Lockwood & Mawson, of Bradford. The style is Early Decorated Gothic. The building consists of a nave, aisles, organ-chancel, and a clock-tower and spire. The tower is at the south-west corner, and under it is the principal entrance. The roofs are open-timbered, and the seats accommodate about 700 worshippers. The total expenditure was estimated at £8,515. Messrs. Dyson & Co., of Brighouse, were the builders.

MARKET WEIGHTON.—The church of Market Weighton, Yorkshire, has been restored, under the superintendence of Messrs. J. B. & W. Atkinson, architects, of York. Three ugly galleries have been cleared away, and the church re-seated throughout. The whole of the roof has been renewed, the north aisle wall rebuilt, and the chancel and chancel arch restored. The cost of the restoration is £1,500, and the church accommodates 630 people. Messrs. Bowman, of York, were the contractors.

NORWICH DIOCESAN CHURCH BUILDING SOCIETY.—The half-yearly meeting of this society was held on Thursday, the 19th inst., when grants were made in aid of building and restoring churches at Boughton, S. Michael-at-Thorn, and S. Mary-at-Quay, Ipswich.

PENDLETON.—The memorial-stone of a new church for the accommodation of the United Presbyterians in Pendleton was laid on Saturday. The style of the building is Gothic of the thirteenth century. It will be built of brick, faced with Yorkshire Pierrepoint stone, and with dressings of Bath stone. The church will accommodate 500 worshippers. The estimated cost, exclusive of a tower and spire, which are not to be built at present, is £2,600. The architect is Mr. W. H. Ward, of Birmingham, and the builder is Mr. E. Johnson, of Manchester.

RIPON.—A new Congregational church at Ripon was opened on Tuesday. The cost of the church has been about £3,000. There are two transepts. A lightly-constructed gallery runs round three sides

of the building. The seats are open, and accommodate about 600 adults. Mr. J. P. Pritchett, of Darlington, is the architect.

RUNCORN.—A new Wesleyan Chapel was opened at Runcorn last week. The style is Italian. The plan of the building is a parallelogram, the length being 90 ft. by 65 ft. wide, the roof being in one span, and the height from floor to ceiling is 41 ft. The front of the chapel is built entirely of Stourton stone, and is 68 ft. wide. The principal feature is the portico, with large centre window above it. Mr. George Harris, jun., was the architect, the builder being Mr. George Harris, of S. Helen's.

SURBITON.—The new chancel aisle of Christ Church, Surbiton-hill, was opened for public worship on Tuesday week. The aisle corresponds in design with the one on the northern side of the chancel. Communicating with the new aisle is a new vestry. There is also a new entrance on the south-west side of the building, a porch having been erected at a cost of £280. The roof of the church has been painted and decorated by Messrs. Lavers, Barraud, & Westlake, at a cost of £400. The architect for the new chancel aisle, which has cost £780, was Mr. C. L. Luck, of Carlton-chambers, Regent-street, and the builder Mr. Samuel Simpson, of Tottenham Court-road.

YORK MINSTER.—The south transept of York Minster, erected about the year 1227 by Archbishop Walter de Grey, has for some time given indications of decay. The dean and chapter called to their counsel and advice Mr. Street. His report as to the critical condition of the south transept fully confirmed the conclusions already arrived at, and the necessity for prompt action. This portion of the cathedral is the earliest in the noble fabric, and is a beautiful specimen of the Early English style. The restoration of the transept is now in a fair way of being accomplished. The restoration will cost at least £10,000.

BUILDINGS.

A NEW PUBLIC HALL FOR GLASGOW.—The prospectus has been issued of the Glasgow Public Halls Company (Limited), which has for its object the erection of a large public hall in Glasgow for concerts and other purposes, after the model of the Philharmonic Hall at Liverpool. The services of Mr. John Cunningham, the architect of the latter building, have been secured by the promoters, and with him is associated Mr. Campbell Douglass, I.A. The site proposed is bounded on the east by North-street, on the north by Berkeley-street, on the west by Rochester-street, and on the south by Kent-road, and has a total area of 12,589 square yards (or thereabouts, including streets, or about 9,910 square yards exclusive of streets. This site is offered to the promoters at £30,000. The plans, which have been prepared by Mr. Cunningham, show a concert hall formed on the model of the Philharmonic Hall at Liverpool, capable of containing, comfortably seated, 1,300 persons in stalls, 444 in boxes, and 1,056 in galleries, making a total of 2,800, besides a chorus numbering 512, and an orchestra numbering 100. In addition, there will be a suite of assembly-rooms, capable of holding 250 couples, with supper and refreshment-rooms on a commensurate scale. In connection with the Concert Hall there will be a large and commodious crush-room, 70 feet by 30 feet, with ample accommodation on either side for retiring rooms for ladies and gentlemen. This crush-room gives access to a corridor which surrounds the entire building, from which there are numerous exits. The expense of the building is estimated as follows:—Concert Hall, including covered carriage-ways, £49,049 5s.; assembly-rooms, including covered carriage-way, £22,352 15s.; cost of site, £30,000; internal decoration, furniture, and fittings, including a grand organ, £20,000; total £121,402. The capital of the company will be £150,000, in 15,000 shares of £10 each.

GREAT BASSES' LIGHTHOUSE, CEYLON.—This lighthouse, which is all in Dalbeattie granite, is now almost completed by the contractors, Messrs. Shearer, Smith, & Co., Dalbeattie Granite Quarries, who are now setting the final portion of it. It is from a design by Mr. James N. Douglass, C.E., engineer to the Trinity Board, and will be erected by that board at Point de Galle, Ceylon. It contains about twenty thousand cubic feet of granite, and the stones are all carefully dovetailed into each other by joggles cut in the top, bottom, and sides of the solid stone. The whole work has been accurately finished and fitted together in the quarries before being despatched.

KIDDERMINSTER.—A new building for the Kidderminster Infirmary was opened on Friday week. The site is at the top of Mill-street, at the entrance to the town, and the successful competitor for the de-

sign of the building was Mr. Bland, of Birmingham, under whose direction the works have been carried out by Messrs. Binian & Sons, Kidderminster. The building is of the most substantial character, and the internal arrangements include the most modern improvements in the construction of such buildings, provision being made for each separate department, with waiting-rooms, surgeons' rooms, dispensary, operating-rooms, nurses' apartments, kitchens, and domestic offices, fever-wards, mortuary, &c. The wards for the reception of patients are lofty, and well-ventilated and arranged. These consist of two on the ground floor and two on the second floor. Each ward will contain eight beds, or 32 beds in all. The total cost was upwards of £5,000.

SPIITALFIELDS.—On Tuesday last the foundation-stone of new schools at the corner of Quaker-street, Spitalfields, adjoining the Great Eastern Railway Station, and in connection with S. Stephen's district church, was laid by Mr. Robert Iianbury. The building will include boys', girls', and infant schools capable of accommodating about 600 children, together with convenient residences for the master and mistress, with the usual offices; while underneath all there will be a spacious drill or recreation ground. The works are being carried out by Messrs. Merritt & Ashby, contractors, from a design by Messrs. T. & W. Stone, architects, of Great Winchester-street, the contract being taken at £4,000.

WOLVERHAMPTON.—The new Town Hall for the Borough of Wolverhampton, which was illustrated and fully described in the *BUILDING NEWS* of July 2, 1869, was opened last week. The new buildings are situated upon the site of the Old Lion Hotel, which was a conspicuous posting-house on the way to Holyhead before railways were opened. When to this there were added, at a cost together of over £12,000, the premises on either side in North-street which had belonged to Miss Mytton and Mr. Charles Higgs respectively, there was at the disposal of the corporation ample space for the erection of all the municipal courts. The Old Lion premises were for some time in the hands of the Corporation, and were partly adapted to town uses before the Council accepted the plan of Mr. Ernest Bates, of Manchester and London, for entirely new erections. Mr. Bates's plans have been carried out by Mr. P. Horsman, contractor, of Wolverhampton, for £17,200, exclusive of certain improvements which have been found necessary since the work was commenced.

WOODBURY, DEVON.—The new national schools were opened last Wednesday; they are built of local brick, with dressings of Ham-hill stone, a plinth of Westleigh limestone, an open-timber roof, covered with Bridgwater tiles, and surmounted by an ornamental bell-turret. The plan consists of a mixed school-room 65 ft. by 20 ft., class-room, a lean-to porch for boys' and girls' caps and bonnets, and an open-timber porch. The master's house is attached to one end of the school-room with offices, &c., behind. The general character of the building is First Pointed. The total cost of the schools, master's house, boundary-walls, &c., was £950; the architect is Mr. R. Medley Fulford, the Close, Exeter, and Mr. R. Phillips, of Woodbury, the builder. After the opening ceremony the vicar (the Rev. J. L. Fulford) presented Lady Drake with a handsome lace handkerchief, in the name of the mothers and children of the school, made in the village, from a design given by the architect.

YORK.—The Corporation of York have at present under consideration a proposal to erect a covered market for the city. According to a report of the committee the market will open from Parliament-street by a covered way 21 ft. in width and 25 ft. in length, such covered way opening upon a market-hall 194 ft. in length and 97 ft. in width, and containing an internal area of 2,046 square yards. The total estimated cost of carrying out this scheme, including fittings, contingencies, and Act of Parliament, is £20,529.

CHIPS.

The first annual meeting of the Hull Reform Building Society was held a few days ago at the Odd Fellows' Hall, Lowgate. The report was of a very satisfactory character.

The gas supply of Aberdeen lately passed into the hands of the Corporation, and as a result of this a first reduction to the consumers of fivepence per thousand feet has just been announced.

Several additions and improvements have just been completed at the Royal Free Hospital, Gray's-inn-road. A new and commodious operating theatre has been added, and the old operating theatre converted into a ward for six beds, besides other alterations by which the number of beds available has been increased from 74 to 100.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 51, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

B. M. FULFORD.—We can never say whether we can give an illustration unless we see the drawing.

RECEIVED.—J. V.—W. T.—J. B.—J. P. S.—C. L. E.—H. G.—O. B.—S. & Sons.

Correspondence.

THE PURLINS OF ROOFS.

To the Editor of the BUILDING NEWS.

SIR,—A few weeks back I read a letter from "Carpenter," calling in question what I had said in a former article to the effect that purlins should be placed at right angles to the direction of the principal rafters, and not vertically, because the direction of the pressure is at right angles to the plane of the roof.

"Carpenter" says he imagines that the pressure on a roof is vertical and towards the eaves, and, as a proof of that, he thinks "you will always find when a purlin gives way, as it does sometimes when there is no principal rafter, that it bends towards the eaves," and he therefore thinks the purlins should be placed vertically.

Now, I look at the case in this way. The load to be carried by the purlins consists of two parts, the dead weight of the common rafters with their load of slates or other covering, weighing, say, 10lbs. per square foot, and the pressure of wind, which may be taken at 40lbs. per square foot. The dead weight acts in the first place vertically, and being supported by inclined beams, tends to slide down them with a force proportionate to the sine of the angle of elevation. If we take the case given in the article from which "Carpenter" quotes, the half-span is 25 feet and the rise 12.5 feet. The slant length of the roof therefore is 28 feet, nearly. The principals are 13 feet apart. The weight on one range of purlins, therefore, is $28 \times 13 \times 10 = 3,640$ lbs. If the range of purlins, with this load on their backs, were vertically one over the other the cross strain upon them unitedly would be that produced by a load of 3,640 lbs. uniformly distributed over their length, but being laid at a pitch of 2 to 1—i.e., at a slope of two horizontal to one vertical, the cross strain on the purlins caused by that portion of the weight which acts in the direction of the length of the principal rafter is proportional to the sine of the angle of elevation, or as 12.5 to 28. The pressure in the direction of the principal rafters is $\frac{3640 \times 12.5}{28} = 1625$ lb.,

and this has to be sustained by the cross strain on the purlins. There are three purlins, each 8×4 , and a poll-plate 4×4 , but as the action of the poll-plate is not directly across its breadth, but anglewise, and requires a different mode of calculation, which might too much increase the length of this letter, we will drop its resistance out of the calculation, and say that the pressure is sustained by the three purlins alone.

Each purlin has a breadth (in the direction we are now considering) of 8 inches. Their united breadth is therefore 24 inches. Their depth is 4 inches. The case then is as if a distributed load of 1625 lb. were put upon three beams side by side, each 8 in. in breadth and 4 in. in depth, the length being 13 feet.

Applying the formula given in another number of "Notes on Carpentry," (No. 8) viz., $D = \frac{625 E b^3 W}{16 E b^3 d^3}$ the deflection will be this, $\frac{625 \times 2197 \times 1625}{16 \times 266 \times 24 \times 64} = 34$ in or a trifle over one-third of an inch. The coefficient 266 is taken as if for red pine. This is the deflection due to a dead weight of 10 lb. per square foot. If a weight of snow be taken into account in addition to the weight of the roof covering, it would perhaps double the weight in an extreme case. The deflection is as the weight, therefore, under a very heavy load of snow there might be a deflection of two-thirds of an inch in the middle of the purlins 13 feet long. But the greater portion of the pressure to be borne by the purlins is that produced by high winds, and this pressure acts at right angles to the plane of the roof, and not vertically. Being the greater pressure, the purlins are laid so as best to

receive it, the lesser inconvenience of a small deflection being suffered in order to meet the main object.—I am, &c., THE WRITER OF THE ARTICLE.

THE NEW LAW COURTS.

SIR,—The writer of your two recent articles relative to the above asserts, in contradiction to the *Times* and other influential journals, that the last designs of Mr. Street have been "formally approved and officially accepted," and that the works "will now be carried on vigorously, without the slightest probability of any interruption." From the authoritative tone of these statements, as well as the minute character of the descriptions given, it is clear that the writer must have access to sources of information not generally accessible. Perhaps he can inform your readers why the approved design has not yet been made public. Some of the adverse journals, apparently with reason, object to a formal approval and adoption without a previous public exhibition, denouncing it as an "arbitrary and hole-and-corner style of proceeding." The points of excellence so much enlarged upon by the writer of the articles would be much more apparent if the designs were published than from pages of letter-press description and eulogium, in which latter he indulges to such an extent as quite to sink the critic in the advocate.—I am, &c., INQUIRER.

[We may inform "Inquirer" that the carrying out of Mr. Street's design may be regarded as a settled thing, which none of the "adverse journals" are likely to disturb. We have good reason for believing that the Government and the law authorities are quite satisfied with Mr. Street's designs and plans.—ED. B. N.]

EMBRYO ARCHITECTS.

SIR,—Architects' assistants and pupils must be possessed with an enviable amount of apathy that the leading article in the *BUILDING NEWS* a few weeks back (September 15th) on "Who Overcrowd the Profession" did not elicit from some of them smart replies to the cutting rebuke contained therein. Was it indifference as to what appears in the public journals concerning them, or did they acknowledge to themselves the justice of the remark, that not more than one in eight are really qualifying themselves for the higher posts of the profession? Possibly it was the latter sentiment that kept them silent, and they may also have found it difficult to overlook the truth of another remark in the same article, that, although the architectural profession is crowded, it is certainly not crowded with architects. Very pungent is this sentence. So, with an unbiased mind, we will look around us, and from our experience of the assistant or pupil endeavour to determine the accuracy or not of it, taking the average man as a basis. He is engaged on what is termed a fair elevation, Classical in style, and is inking it in. We shall see exemplary neatness in all the straight lines; but look at the Ionic or Corinthian caps, at the mouldings, particularly those which have to be reversed, such as the bases, or, in fact, at any part of it where the tee, or set-square has to be put aside. Not only is the form not correct, but the line is as different in decision from the rest of the work as it could be—or, in a sentence, at the point where the simple part of the drawing terminates and the artistic touch or power of drawing commences, at that very point is discovered the inability of the draughtsman to meet it. Look, again, at the full-size details: the lines are such that if the workman into whose hands they are put executed the work in accordance with them, it would be at once rejected by the very man who gave him the drawing. In fact, it is a rarity to see a really good line drawing. The fashion now is to endeavour to hide defects by etching or colouring, which, of course, in most cases only makes them more glaring; and then, as to the etching itself, in nearly every instance we shall find Mr. Street's method adopted, viz., etching with a diagonal line or lines at different angles. A more absurd method of representing plain surfaces was never invented; it gives the idea rather of indents; but if the same or any other eminent gentleman endeavoured to indicate deep shadows in his pictures by the free use of Chinese white—the average draughtsman would immediately try to imitate him.

We have been speaking now of the mechanical, but nevertheless the very essential, portion of the young architect's powers. But, it may be said, their mental capabilities atone for this bad drawing. Do they? Let us look, then, at their designs. Very good in their way some of these may be; but we shall see in most of them unmistakable signs of the source from whence they were derived. Of course, no blame can attach to the pupil or assistant who copies good ex-

amples; but we do expect to find a little original thought, a little evidence that the designer has not trusted entirely to the example before him. And again, as to the general architectural knowledge of these young architects, to be discovered we will say during the course of a conversation on the subject, we shall find them displaying very praiseworthy attention as listeners to the arguments of others, and they may possibly ejaculate "Ah!" "Yes," "Of course," and so on; but do they add to or even deduct from the propositions adduced? They may be, and we will give them credit for being, very profound; but it can be said of them, as Leeds once said of Ruskin, "Profound enough, no doubt, because if there be any meaning at all in some of their thoughts and expressions it lies at such fearful depth below the surface that without making a descent in a diving-bell it is impossible to get at it." Glance, again, at the professional correspondence of some of them. It will often contain ungrammatical sentences and bad orthography. And, lastly, as to their sketches. How often do we see them as they were finished on the spot? They have been brought home, relined in, curves made something like curves, shadows put in, &c., and then exhibited as sketches made from an existing building. We don't want such as these. Let us have the sketch as it was made in the open, and not the result of a little sketching on the spot and a great deal of guessing at home. Such procedure would not have given us the careful sketches Mr. Burges has recently published. At the approaching *conferenza* of that admirable body of architects-in-embryo, the Association, sketches will be exhibited, no doubt; but how many of them honest sketches in the real sense of the word? We shall see in the oft-exhibited sketches, the very familiar sketches of even the elders of that body, distinct evidence of the periodical retouching up and painting of all the curves until the lines appear quite indented with the amount of labour expended on them. All this ought not to be. There must be more honesty amongst the future representatives of the profession. The motto, "Nulla dies sine linea" may not perhaps in every case be possible to abide by; but if the assistant or pupil works on conscientiously, and pays attention to the simple injunction (and it has often been instilled into me) that what is worth doing at all is worth doing well, the painful assertion that not more than one in every eight are preparing themselves for the higher posts of the profession will soon become an untruth.—I am, &c., W. W.

PLANNING HOUSES.

SIR,—“M.” is in the main correct, and might, with perfect truth and safety, extend his animadversions to the works of other professors and non-professors. Sincerely hoping you will act upon the admirable suggestion with which he concludes, I am, &c., F.

[We should be very glad to publish a sheet or more of such designs as mentioned by “M.,” page 293 in last number of B. N.—ED.]

Intercommunication.

QUESTIONS.

[2353].—Fastening Stiles to Circular Heads of Gothic Doors.—What method is employed to fasten the stiles to the circular heads of Gothic doors, without pinning them?—AN APPRENTICE.

[2354].—Treads and Risers.—What method is employed to fasten treads and risers to strings of staircases, when the treads and risers are wrought, and show on both sides?—AN APPRENTICE.

[2355].—Price of Deals.—What is the price per 100 for deals of pitch pine, and can they be procured sound and free from sap? Is the price of deals, &c., as given in the *BUILDING NEWS* every week, the price at the docks, or is it the average price at timber yards?—AN APPRENTICE.

[2356].—Sewage Irrigation.—Can any reader of "Intercommunication" tell me how sewage is disposed of during long frosts, where sewage irrigation is the means adopted for purifying or utilising town sewage?—C. S.

[2357].—Scientific Construction.—In a wrought-iron roof the T struts are sometimes fixed with the flange uppermost, and sometimes with it on the underside of strut. Which method is the most correct, as regards scientific construction?—A. M.

[2358].—Carpenter and Joiners' Improvement Society.—Together with some of my shopmates, I propose to form a Carpenter and Joiners' Debating Society, or Mutual Improvement Association. We intend to meet once a week, and have essays and discussions on subjects in direct connection with, or relating to, our trade. Would any correspondent be kind enough to give us some information as to the formation, routine, and success of any similar associa-

tion, together with any useful hints which may occur to them?—JOHN W. HARDIE.

[2359].—**A Legal Question.**—I shall be obliged if any reader can advise me in the following matter:—A. owns the freehold of a house, and also the basement only of the adjoining premises belonging to B. Can B. claim any damage that may accrue by A's pulling down and rebuilding his (A's) basement under B's house, or has A. any right to the property above his basement?—W. T. II.

[2360].—**Old Brick and Timber Houses.**—Will some contributor to "Intercommunication" kindly inform me which is the best book on the subject of brick or plaster and timber houses of the sixteenth and seventeenth centuries, and what architect has studied the subject with reference to their restoration? The restorations and new buildings of the style which have come under my notice in Chester, Shropshire, and elsewhere are overdone, and their want of solidity and proportion scarcely satisfactory. In all I have seen there is a lack of repose which does not please the eye, the spirit of the old builders is wanting. Can association be the cause?—O. H. M.

[2361].—**Scales.**—Will any reader inform me of the best way to re-black the figures in a boxwood scale, the originals having been washed out?—PROVINCIAL.

[2362].—**Handrailing.**—Can any reader refer me to an accessible work containing the following, or explain the method? Given the plan (A) of the handrail round the well-hole of a geometrical staircase, to construct the elevation of the curve (elevation of risers, &c., being given).—SCIENCE.



REPLIES.

[2326].—**Principal and Interest.**—£1,462 being both capital and interest, the puzzle is easily explained. In deducting 17 per cent. from the whole amount, interest has been included upon interest, as well as upon capital, instead of upon capital alone. £1,462 consists of 100 parts capital and 17 parts interest, 117 parts in all. Consequently, if we multiply £1,462 by 100, and divide by 117, we get the capital, which would be £1,249 11s. 5d. $\frac{51}{117}$; and if we multiply £1,462 by 17, and divide by 117, we have the interest, £212 8s. 6d. $\frac{66}{117}$. It is only necessary to make one of the two calculations, and then deduct the result from the gross amount given to find the other, but by making both calculations one proves the other. Any other sum of the same kind can be worked in the same way, adding the capital known to the interest known for a divisor, and then multiplying with the known capital to find capital, and with the known interest to find interest.—ROBT. A. WHITELOCKE.

[2329].—**Asphalting.**—I have heard the price mentioned for the asphalting of Cheapside put at 18s. 6d. per square yard.—T.E.O.

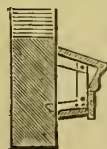
[2333].—**Breaking-Weight of Lattice Girder.**—The breaking-weight may be found from the following formula, in which W = weight at centre; A = net section of angle-irons—that is, after deducting the area of the rivet holes; D = depth; L = span; and C = a constant, which may be taken for a lattice-girder at 72. The equation is—

$$W = \frac{A \times D \times C}{L} = \frac{3.5 \times 5 \times 72}{60} = 21 \text{ tons.}$$

In the question there is no size mentioned for the rivets, so I have taken them at $\frac{3}{16}$ in. diameter, which is the usual size for angle-irons $\frac{3}{16}$ in. thick. Should there be a pair of angle-irons in each flange (which is presumable, although not mentioned), the value of W will be 42 tons.—N.E.O.

[2334].—**Lithofracteur.**—There are no London agents. It is cheaper than blasting powder, and perfectly safe to send by rail; but the import of it into England is most strictly prohibited by Government. The fact is, the Government have "gone in" for gun-cotton and dynamite, and will not allow Kreh's explosive a ghost of a chance, although it was tried at Shrewsbury with the greatest success.—ONE WHO WAS THERE.

[2336].—**Measuring Artificers' Work.**—The cradling depicted would be accurately measured superficially—length by width of soffit only—not girth, as shown. Girth measurement would only be correctly applied to cradling framed, and having two or three faces—such as, for instance, a sham beam or archway, or for soffit and fascia of a cornice, or thus: Lineal measurement describing width or girth, also the distance apart of the brackets, or numbering the brackets and giving their length and scantling, would be equally accurate, and in some instances the preferable method.—F.



[2342].—**Concrete Cottages.**—Concrete houses having one-chamber floor only should have the external walls 9 in. thick; but where there are two-chamber floors, they should not be less than 12 in. It may be taken as a rule that buildings which would require 9 in., 14 in., or 18 in. brick walls should have the same, if constructed of concrete, respectively 9 in., 12 in., or 14 in. thick. One part (by measure) of best Portland cement, and seven parts of shingle, including a fair

proportion of sand, make good and substantial work. Cobbles, or any old stones or bricks, may be used as packing, care being taken to well bed them in the concrete, and leaving a space of 3 in. between them, and 2 in. from the inner and outer faces of the walls.—T. P.

[2344].—**Roofs.**—Evidently meant to be a common span roof—that is, with no framed principals, but having rafters of an extra size, at certain distances apart, to carry the purlins.—T. P.

[2345].—**Door-Frames.**—Proper door-cases mean the casings to rough partition-posts, so as to represent, in a "proper" manner, solid door-frames; but the latter are often improperly called "door-casings."—T. P.

[2345].—**Door-Frames.**—"Proper" is a metropolitan synonyme for "wrought, rebated, headed, framed, and fixed complete." In a Gothic building, I presume, they would be "proper" if stop-chamfered instead of beaded.—F.

[2346].—**Tendering.**—Were I in "A Country Builder's" position I should feel tempted to leave at the option of the proprietor the acceptance of my tender, or of immediate legal proceedings to recover compensation for "time and trouble," provided always the clause "the lowest or any tender not necessarily accepted" was not, in this instance, quoted. Subpoena architect as a witness. Cannot quote legal precedent. Consult a solicitor previous to passing the Rubicon.—F.

[2347].—**Arbitration Fees.**—C. would naturally obtain his fees from A. and B. (who appointed him by joint letter) previous to giving in his award, provided he entertained the remotest idea of handling such *solatium*.—F.

[2348].—**Amiens Cathedral.**—The trefoils referred to in the article on "Foil Design" are not in the arcade above the west portals, but on the face of the pier between the central one and the southern one. They spring from the same level as the great arches.—THE WRITER OF THE ARTICLE.

[2352].—**Surveyors' Fees.**—£5 per cent. has been paid in a similar instance.—F.

LEGAL INTELLIGENCE.

ACTION AGAINST A CLERK OF WORKS.—THORNGATE V. WICKS.—In this case, heard at the Godalming County Court on the 19th inst., the sum sued for was £29s. for certain colouring work done at the house of Mr. Norton, at Worplesdon, and of which defendant had been the clerk of the works. Mr. Geach appeared for the plaintiff, and Mr. Sparkes for the defendant. The point at issue was as to who gave the order for the work. The contract for the work was undertaken by a man named Stent, and the plaintiff had been employed under him. During the progress of the work the plaintiff asserted that the defendant gave him instructions to do the colouring work charged for, telling him that it was quite independent of Stent's contract, and that it would be paid for separately. To support this statement Stent was called, but his evidence went to show that the contract taken by him included the very work done by defendant, and that he had received the money for it. In cross-examination by Mr. Geach, the plaintiff admitted that he had made out the account first to Stent, but he did so in order that he might obtain the money from Mr. Norton when he paid for the contract. The defendant denied ever giving any authority to the plaintiff to do work apart from the contract. He certainly instructed the plaintiff to do the colouring, but it was under the agreement with Stent, who had been paid for the same. His Honour (H. J. Stonor, Esq.) found a verdict for defendant, and allowed the costs in the case.

LIABILITY OF LOCAL BOARD.—In the recent case of Foreman v. the Mayor of Canterbury, it appeared that the servants employed by the Local Board on the repair of the highways under the Board's control had negligently left a heap of stones in the road without any light or means of seeing it, whereby Foreman was upset while driving along, and was injured by the stones. It was held that the Board was liable for the negligence of their servants.

THE ENCLOSURE OF WANSTEAD FLATS.—Relative to the recent inclosures on Wanstead Flats, Mr. E. J. Daniells, solicitor to the Forest Fund, and Mr. W. G. Smith, hon. sec., attended at the Stratford Police Court on Friday last to apply for a summons against Mr. Samuel Johnson, of Lake House, Wanstead, for obstructing a right of way through the Brushwood Avenue, and terminating at the Green Man, Leytonstone. It was clearly shown on the Ordnance map, and on the map published by the Tithe Survey Commission. In 1866 the tenant of Lake House fenced in the land and erected wicket-gates which admitted of free passage. Now, however, five-barred farm-gates, with chains and padlocks, were substituted, and a field was ploughed up which had not hitherto been cultivated as arable land. The pathway formed a portion of the parish boundary, and was one of the most beautiful walks in the neighbourhood of the Forest. The obstruction was a great inconvenience to many of the freeholders in the neighbourhood. The sitting magistrate (Mr. S. L. Howard) said that

the ploughing up of the land could not, in his opinion, be held to be an obstruction; but with regard to the newly-erected gates, the summons would be granted.

COURT OF BANKRUPTCY, OCTOBER 24.—A BUILDER'S FAILURE.—RE CHARLES HENRY TREW.—The bankrupt was a builder, of 29, Elliott-road, North Brixton, owing debts £2,471 10s, and returning assets at £1,185. He petitioned the Court under the liquidation clauses on the 10th of August last, but not being able to obtain the necessary assents the liquidation proceedings fell through. Mr. H. G. Hammond, of Bishopsgate-street, a creditor for £54 12s. 6d., afterwards obtained an adjudication of bankruptcy, and Mr. Aird, solicitor, now applied that the liquidation proceedings might be transferred and filed with the bankruptcy proceedings. Mr. Registrar Brougham granted the application.

SURVEYORS' FEES.—MILLAR V. COX.—The plaintiff in this case, tried at the Clerkenwell County Court on Monday last, was Mr. James Millar, a surveyor, and he sued Mr. Cox, an auctioneer and estate agent, of Bermondsey, for £4 4s. for professional services. The plaintiff stated that he was engaged by Mr. Piddell, the defendant's solicitor, to give evidence in an action in which the defendant was interested, and it was agreed that he was to have £1 11s. 6d. per day for his attendance. He had received £1 1s., and there was now £4 4s. owing. Application had been made on several occasions to Mr. Piddell for the money, and various excuses had been made, but the claim had not been objected to. Mr. Piddell was sworn, and stated that he engaged the plaintiff on behalf of the defendant. He told him that the fee would be one guinea per day for attendance, and the plaintiff said he would be very glad to accept it, as he was not very busy then. He (Mr. Piddell) was always very particular on this point, as the greatest difficulty might arise, as the taxing-master would not allow more than one guinea per day for attendance.—The plaintiff said that the fee mentioned was undoubtedly one guinea and a half.—Thomas William Millar, the plaintiff's son, deposed that he rendered the account to Mr. Piddell, and had asked him for the payment of it on several occasions since, and he only made some excuse for not paying. No objection was ever taken to the charges made.—Mr. Piddell said it was not likely that he would have promised to pay half a guinea more than he could obtain in costs.—The plaintiff said that had nothing to do with the matter, because he had received as much as three guineas per day for attendance. The judge (Gordon Whitbread, Esq.) said that to obtain a verdict for a larger sum than the usual fee the plaintiff should have obtained the promise in writing. He gave the plaintiff a verdict for two guineas.

WATER SUPPLY AND SANITARY MATTERS.

LONDON WATER.—Mr. Chichester Fortescue has appointed Major Frank Bolton, R.E., to be Water Examiner under the Metropolis Water Act, 1871.

IRRIGATION WORKS AT LEAMINGTON.—On Monday the chairman of the Leamington Board of Health formally opened the sewage irrigation works which have been constructed in the town at a cost of £16,000. The magnitude of the works and of Lord Warwick's irrigation farm (the latter is intended to include 1,000 acres) has excited considerable interest in the county. The two condensing rotary beam-engines, erected at the pumping station, are 180 horse-power each, and either will pump 1,500,000 gallons in twelve hours. The steam cylinders are each 36 in. in diameter, and the pistons have a stroke of 8 ft.; the fly-wheel is 24 ft. in diameter. The beams weigh upwards of 15 tons each. The pumps are 26 in. in diameter and 5 ft. stroke. Steam is supplied by three Lancashire boilers, each 24 ft. long by 7 ft. in diameter. The rising main, 18 in. in diameter, is 2½ miles long. The engine-house is in the modern Italian style, and is 70 ft. by 30 ft., 55 ft. high, the foundations being 26 ft. deep. At the preliminary trial one engine pumped 25,000 gallons of sewage in an hour and a half, working 10½ strokes per minute, with a recorded pressure of 60 lb. per inch on the boiler. The population of the district at the last census was 23,429; and in ordinary weather one pair of pumps will exhaust the whole of the sewage by working four hours a day. The engines and boilers cost nearly £5,000. Fortunately for the town, the Board were not put to the expense of purchasing land for irrigation purposes. After various negotiations, the Earl of Warwick undertook to dispose of the sewage for a term of thirty years. In consideration of his lordship paying £450 a year towards the pumping expenses, the Board agreed to erect, at their own cost, engines, main, and to pump the sewage on to his lordship's estate, the highest altitude to which it is to be pumped being 132 ft. The irrigation farm has been prepared by Mr. Clifford, who has had considerable experience in such matters. Many acres have already been sown with Italian rye-grass, &c. A model cattle-house has been erected for the accommodation of several hundred head of stock, and many of the stalls are already filled, milch cows forming an important item in the herds. Supplies of crops and fat beasts

are to be sent to the metropolitan and other markets. Mr. Tough, formerly of the Dorking Sewage Farm, has charge of the husbandry department. This, if not the largest sewage farm in the country, will in all respects be a model, Lord Warwick having spared no labour or expense in order to test the principle of utilising sewage by means of irrigation.

SCARLET FEVER IN THE PEABODY BUILDINGS, BLACKFRIARS.—Some alarm has been occasioned among the occupiers of the Peabody-buildings, Blackfriars, through the outbreak of scarlet fever. Dr. Bateson reports that he found eight persons suffering from the disease, and two cases had already proved fatal. The *South London Courier* says the ground-floors are in a very damp condition, and no doubt the disease may be attributed to this circumstance. It might be as well to ascertain if the sickness is attributable to the theory, broached by a correspondent, that fevers occur in the ninth month of a new house.

THETFORD.—A special meeting of the Thetford Town Council was held on Thursday, the 19th inst., when the plans and reports for the drainage and waterworks of the borough were opened, as follows:—That of Messrs. Church & Son, whose estimate was for the drainage works £3,008, for the waterworks £3,902, total £6,910; Messrs. Russ & Minns, drainage £3,568 1s. 8d., water £4,339 10s. 8d., total £7,907 12s. 4d.; Messrs. Whittaker & Perrett, drainage £3,590, water £3,900 (if obtained from the river above Thetford-bridge) and £3,580 if obtained from a well, totals £7,490 and £7,170. No decision was come to upon the plans and estimates.

OVERFLOW OF SEWAGE AT KING'S-CROSS.—Some defect appears to exist in the sewerage of King's-cross and its neighbourhood, and the result is that the inhabitants suffer from a periodical sewage inundation in their cellars and kitchens. Of the inconvenience arising from such a state of things it is needless to speak, and the residents have just grounds of complaint at being subjected to such disagreeable visitations. At a meeting held on Monday evening to consider the question, they resolved to send a deputation to the local boards, with a view to secure their support to a memorial which it is intended to address to the Metropolitan Board of Works, calling upon that body to remedy the defects complained of.

Our Office Table.

ARCHITECTURAL ART CLASSES.—The opening meeting of the Architectural Art Classes will be held at the Architectural Museum on Thursday evening next (November 2nd), under the presidency of the chairman of the Joint Committee, Mr. Alfred Waterhouse.

LEAD AT JERSEY.—An addition has recently been made to the underground wealth of the British Isles by the discovery of lead in Jersey. Experiments have been going on which prove to a certainty the existence of a rich vein of lead ore in what was supposed to be merely a mass of rock. A vein issues from the foot of a precipitous cliff in the Cove of La Pulec, and runs down to the sea, improving in quantity and quality as it goes on. From 50 to 60 per cent. of good lead has been obtained from the ore already procured, and it is believed that this vein, which runs north and south, crosses S. Ouen's Bay and re-appears in the eastern cliffs. Some years ago lead and silver were found in the Island of Sark in small quantities, and the recent discoveries tend to the belief that formerly the Channel Islands were all one stretch of land, since separated by volcanic agency. Copper has also been found at Jersey.

METROPOLITAN IMPROVEMENT.—The parish authorities of S. Mary-le-Strand have decided, with the cordial consent and co-operation of the rector, the Rev. Dr. Evans, to move back the railings on the southern side of the church for the distance of 8ft. and on the northern side for 18in., and widening the Strand on each side to that extent. The eastern and western approaches to the church will also be altered, and the entire amount of space thus given up to the public use will be nearly 2,000 superficial feet. The only matter necessary to complete the negotiations is to obtain a faculty from the Bishop of London. The entire space from Newcastle-street to Somerset House will be paved with asphalt.

EDINBURGH AND LEITH ENGINEERS' SOCIETY.—This society held its first meeting for the season on Thursday week. A paper was read by Mr. Alex. Leslie, C.E., president of the society, the subject of which was "The Water Supply of Towns." In it allusion was made to the numerous different sources from which it is possible to obtain supplies of pure water, with remarks on what is generally considered a fair amount to provide for each inhabitant, with reference to prospective increase. Reference was also made to the effect of the drainage area on the chemical constituents of the different waters, and

also on the great diversity of opinion at present existing among eminent chemists and physicians as to the effect on the human system of the use of hard and soft waters.

CANAL BANKS.—An American engineer proposes to prevent the washing away of the banks, which has always been the great difficulty in canal navigation, by placing a continuous iron apron over the bank, so as to protect and stiffen it. This apron or covering will be held in its place by posts which are driven into the ground at the edge of the tow-path, and will of themselves strengthen the bank. The upper edge of the iron casing is to be rounded, to prevent any injury from ropes when horses draw up the barges. Galvanised iron is to be employed, in order that it may resist the action of the water.

SLADE FINE ART LECTURES AT CAMBRIDGE.—Sir M. Digby Wyatt, the Slade Professor of Fine Arts at Cambridge, will lecture in the Fitzwilliam Museum as follows:—Oct. 31, "Fresco Painting;" Nov. 1, "On Decorative Painting Generally;" Nov. 7, "On Illumination;" Nov. 8, "On Art in Glass;" Nov. 21, "On Art in Bronze;" Nov. 22, "On Art in the Precious Metals." Time, 2.15 p.m. each day.

THE PEABODY ESTATE AT BRIXTON.—Very tardy progress is being made on this estate, which cost the late Mr. Peabody £16,000, for the benefit of the poor of London. A few houses have been erected and sold, and let at good rents, by builders, but how the products of the rents, &c., can benefit the poor is a mystery to many. It was conjectured that lodging-houses, to be let to the working classes at cheap rent, would have been built, as being more in conformity with the intention of the munificent donor, who purchased this land at Brixton about six years ago; but it is probable that in the next generation the ground may be built over and the benefits accrue to future posterity.

MONSTER CASTING FOR THE NEW ALBERT BRIDGE.—The largest cylindrical iron casting ever made (according to the *Mining Journal*) was run on Tuesday week by Messrs. Robinson & Cottam, of the Battersea Works. It is an immense iron ring, 21ft. in diameter, 4ft. 6in. in height, and 1½in. in thickness. Its weight is about 10 tons, and it is the first of several of the same kind which are about to be cast by the same firm for the piers of the new Albert Bridge, Chelsea. It is a fine specimen of loam casting, and although nearly double the diameter of anything ever before attempted, is a thorough success. About 40 tons of iron were used in forming the mould and core of this cylinder, besides a large number of bricks.

MONSTER SAFE.—Messrs. Chubb & Son, of St. Paul's Churchyard, have just completed for a banking firm an iron and steel safe weighing fifteen and a half tons, the size being 8ft. high, 8ft. 8in. wide, and 10ft. 6in. deep.

WIDTH OF NEW LONDON COURTS AND ALLEYS.—At the usual fortnightly meeting of the Whitechapel District Board of Works on Monday last, a project was submitted by the Trustees of the Charity Estates of Whitechapel, to pull down certain houses in Princes-street and Bell-court, Mile End New Town, and to rebuild other houses as shown on a plan submitted. A formal application had been made to the central authority (the Metropolitan Board of Works) for permission to carry out this work, and they had in the usual way called upon the District Board to express an opinion upon the matter. The Surveyor, in reply to questions, stated that it was intended to demolish twenty-two dwellings, and to erect ten others in lieu of them. The plan provided for 777 ft. of court space, and 1,406 ft. of private space. He was of opinion that the carrying out of the work would effect a considerable improvement in the condition of the place. A member of the Board remarked that the regulations of the Metropolitan Board provided that no new courts should be constructed having a pathway of less than 20ft. in width, but in this case it was proposed to make one of only half that extent. Such an application, if made by a private individual, would not be entertained; why, then, should it be granted when made by a public body? He moved that a recommendation be sent to the Metropolitan Board that the application be not granted unless a path of 20ft. wide was made. On the other hand, it was urged that as the width of the court at the present time was only 3ft. 10in., it would be a great improvement to extend it to 10ft. It was ultimately decided that the Metropolitan Board should be recommended to grant the application, especially as its refusal would cause the property to be left in its present state.

THE ALBERT MEMORIAL CHAPEL, WINDSOR CASTLE.—Baron Triqueti has just forwarded to Windsor Castle two of the fine marble tableaux executed

for the Queen, and intended for the partial decoration of the walls at the east end of the interior of the Albert Memorial Chapel, once known as the Wolsey Chapel, or Tomb House. These marble pictures were locked up in Paris during the late siege, and as some of the costly marbles and stones used in their embellishment were only procurable in Germany, the works were impeded till the conclusion of peace. One of the tableaux is now being placed in position on the north wall at the east end of the interior. The subject is the entombment of the Saviour.

YARMOUTH SCHOOL OF ART.—The annual distribution of prizes in connection with the Yarmouth School of Art took place at the townhall on Friday evening last. The report of the committee stated that the past year has been peculiarly one of trial. At the commencement a new master, Mr. Ryan, had lately been elected to follow one whose success had been very considerable, and, at the same time, from the general advancement of art throughout the kingdom, the department has raised its standard of merit and instituted several tests at the annual May examinations. Very favourable results have, however been obtained under these circumstances. In the third or advanced grade, ten prizes have been obtained against seven last year; in the second grade there has been a falling off from the causes mentioned, but ten prizes have been taken; while in building construction and geometry five Queen's prizes have been obtained. No fewer than 442 works were forwarded to Kensington in April for examination, against 300 last year and 67 in 1869.

OPENING OF QUEEN VICTORIA STREET.—The Metropolitan Board of Works propose to open the new thoroughfare named Queen Victoria-street, leading from the Victoria Embankment at Blackfriars Bridge to the Mansion House, on Saturday, November 4. The opening of this thoroughfare will complete the new line of communication between Westminster and the City.

S. THOMAS'S CHURCH, HULL.—In the competition for designs for this church, ten sets of drawings were sent in. The voting of the committee placed Mr. Kitching's (Hull) design first; Messrs. Goldie & Child's second; and Mr. Hagen's (Hull) third.

THE BURIAL PLACE OF SIR JOHN BURGONYE.—Many of our contemporaries, remarks the *Guardian*, have committed themselves to the error made by the *Times* in calling the church in which were buried the remains of Sir John Burgoyne, the Tower Chapel. If we understand the reports, the funeral really took place in the parish church of S. Peter, on Tower-green, not in the chapel of S. John, White Tower, as might, perhaps, have been supposed. S. Peter *ad Vincula* is the parochial centre of all that lies within the Tower moat, and has always been, until intramural cemeteries were abolished, the burying place of those who were domiciled in the parish. Sir Thomas More was, it is generally allowed, buried at Chelsea, though the *Times* speaks of his grave in S. Peter's. Edward the Fifth and his brother were perhaps the only persons buried in the consecrated precincts of S. John's; it is said to have been owing to the piety of a chaplain that the staircase under the chapel was chosen for them.

CHIPS.

A movement is on foot in the Isle of Wight for the erection of a memorial to the late Sir John Simeon, M.P.

The Mayor of Ryde (E. Thurlow, Esq.), laid the foundation-stone of the new fever wards in connection with the Royal Isle of Wight Infirmary, on Wednesday, the 11th of October. Mr. Thomas Hellyer, of Ryde, is the honorary architect.

The amalgamation of the London and North Western and the Lancashire and Yorkshire Railway Companies is now an established fact.

A meeting was held in Manchester on Friday evening, the 20th inst., to discuss the project of erecting a Trades Hall.

The new Reform Club House, King-street, Manchester, was opened on Thursday, the 19th inst., by the Right Hon. Earl Granville.

The first meeting of the Society of Antiquaries for the session of 1871-72 takes place at Somerset House on the evening of November 23rd.

An association has been formed in Hackney to oppose the formation of a cemetery on the Clapton Park Estate. Reference has already been made in our columns to the project.

A Prussian tender for the great iron building which will form the centre of the Vienna Exhibition of 1873, has been accepted. In the competition English iron manufacturers were considerably distanced, French and Belgians running close together.

The New Wesleyan Chapel at the corner of Palm-grove and Talbot-road, Cloughton, was opened on Thursday, the 19th inst. Cost of finished portion, to accommodate 300 persons, £3,900. Total cost estimated at £6,000.

Timber Trade Review.

PRICES, October 23.—Oak staves, per mille of pipe: Memel crown, £175; ditto brack, £150 to £155; Dantzic, Stettin, and Lauenro, £225 to £260; Canadian standard pipe, £35 to £90; Puncheon, per 1200 pieces, £25; Bosna, single barrel, per 1200 pieces, £30; United States pipe, £45 to £55; Hoghead, heavy and extra, £35 to £45; ditto slight, £30 to £32.

Timber, per load of 50 cubic feet: Indian Teak, £12 10s. to £13 10s.; African oak, £7 to £8 5s.; Australian ironbark, £6 to £6 10s.; Cuba Sabica, £8 to £9; Greenheart, £5 10s. to £6 10s.; Quebec oak, £6 to £6 10s.; Elm, £3 10s. to £4; Ash, £3 15s. to £4 15s.; large yellow pine masts, £4 5s. to £6 10s.; Oregon masts, £7 to £13; New Zealand masts, £6 to £7 10s.; Quebec large birch, £4 to £5; New Brunswick and Prince Edward's Island, £3 to £3 10s.; ditto small averages, £2 10s. to £3 10s.; pitch pine, £3 10s. to £4; large Quebec yellow pine, £4 10s. to £5 10s.; St. John's and board pine, £4 to £5; building sizes, £3 10s. to £4; Memel best middling, £3 10s. to £4; ditto common middling, £2 12s. to £2 15s.; Sundswall, £2 6s. to £2 15s.

Wainscot logs, per 18ft. cube: Riga crown, £5; ditto brack, £3 to £3 5s.; Memel crown, £4; ditto brack and unquarred, £2 to £2 10s.

Deals, &c., per Petersburg standard hundred: Pitch pine planks, £12 10s. to £13 5s.; Wyburg best yellow, £10 to £10 10s.; Quebec best spruce, £9 15s. to £11 5s.; ditto second quality, £8 15s. to £9; ditto third quality, Quebec first bright yellow pine, £18 to £19 15s.; ditto £8 to £8 10s.; Archangel best yellow, £12 15s. to £14 10s.; Petersburg best yellow, £13 to £13 15s.; second quality, £13 10s. to £13 15s.; ditto third quality, £9 to £9 5s.; Petersburg and Riga white deals, £8 10s. to £9 5s.; Baltic and best Swedish deals, £10 10s. to £12 10s.

Deck boards, per 40ft. 3in.: Dantzic crown, £1 to £1 6s.; ditto brack, 15s. to 18s.

Trade News.

TENDERS.

HENDON.—For a Franciscan convent, proposed to be erected at Mill-hill, near Hendon, for the Rev. the Superiress, Messrs. Goldie & Child, architects. Quantities supplied by Mr. Jas. Schofield.

King & Sons	£3416
Putman & Fotheringham	5198
Jackson & Shaw	4993
Myers & Sons	4987
Longmire & Burge	4800
Gaminou & Sons	4797
Hill, Keddell, & Waldram (accepted)	4645
Eneysson & Co. (too late)	4572

LEYTONSTONE.—For the erection of six shops and residences near the church. Mr. William H. Arher, architect:

Ennor	£1440
Ashmole	1420
John Ingham	1300
F. and F. J. Wood	1285
Arher	1250
Brown (accepted)	1100

LONDON.—For stabling, for Alexander Clark, Esq., Rathbone-place. Quantities not supplied. Mr. Peckles, architect:—

Bishop	£2098
Perkins	1797
Hearle	1797
Kelly Bros.	1715
Newman & Mann	1696
Mortar	1693
Edbs & Son	1678
Vaughan	1594
Baugh	1580
Eaton & Chapman	1534

SURREY.—For providing and fixing washing and other apparatus, and supplying same with hot water, &c., at the new infirmary, Newington Workhouse, for the Guardians of S. Saviour's Union. Messrs. Henry Jarvis & Son, architects:

Smith	£1895 0 0
Jeakes & Co.	1720 0 0
May	1573 9 0
Turner & Co.	1540 0 0
Benham & Co.	1495 0 0
Fraser Bros.	1425 0 0

SURREY.—For constructing and fixing, at Newington Workhouse (new infirmary), bed, coal, and dinner lifts, for the Guardians of the Poor of S. Saviour's Union. Messrs. Henry Jarvis & Son, architects:

Jeakes & Co.	£204
May	165
Elliott	160
Benham & Sons	159
Turner & Co.	155
Waygood	155
Stannish	151
Warren, Hands, & Co.	140
Smith	127

SURREY.—For providing and fixing pendants, brackets, &c.; and laying on gas to same, with necessary pipes, &c.; and providing and fixing ventilating apparatus at the new infirmary, Newington Workhouse, Watworth-common, for the Guardians of S. Saviour's Union. Messrs. Henry Jarvis & Son, architects.

Martin & Co.	£300 0 0
Beck & Co.	200 0 0
Richardson, Slade, & Co.	185 0 0
Clutterbuck	170 3 5
Jeakes & Co.	164 10 2
Buchanan	157 10 0
May	150 0 0
Miles	149 10 0
Biggs	143 7 5
Chandler & Son	131 17 0
Randall	127 8 0

SUSSEX.—For two new lodges at the Grove Farm, for Charles G. Everfield, Esq., Hollington. Messrs. F. H. Fowler & Hill, architects, London and St. Leonarda.

W. Avis (accepted)..... £431

TURNHAM-GREEN.—For laying pipe sewers and constructing gullies and ventilating shafts for the British Land Company (Limited), on their estate at Turnham-green.

Pearson	£559 0 0
Williamson	544 0 0
Wymore	496 0 0
Harris	484 0 0
Kent	474 0 0
Pizzey	470 0 0
Haynes, J. & J.	447 0 0
Bloomfield (accepted)	444 15 0

Ashton & Green, Slate and Slab Merchants and Quarry Agents.—Shippers, Merchants, and Contractors furnished with Price Lists of every description of ROOFING and MANUFACTURED SLATE, Railway-rates, &c. Agents for London and Country for the Sale of the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices of A. & G.'s RED RIDGE TILES, specially prepared for use with these Slates, on application.—Offices and Show-rooms, 14 & 15, Bury-street, St. Mary Axe, London, E.C.—[ADVT.]

CONTRACTS OPEN FOR BUILDING ESTIMATES.

SITTINGBOURNE, October 30.—For the supply of 150 tons of granite spalls.—Mr. W. J. Harris, Clerk to Improvement Commissioners, Sittingbourne.

STROUD, October 30.—For the excavation and removal of about 6,000 lineal yards of earthwork for an additional reservoir.—Edwin Witchell, Clerk to the Local Board, Stroud.

SURREY, November 21.—For dredging mud from the Surrey Commercial Docks by steam dredgers, and lightering away, landing, and disposing of the mud on land to be found by the contractor.—J. Griffin, secretary, 106, Fenchurch-street, London, E.C.

CHORLTON, November 14.—For the supply and erection of apparatus for the manufacture and storage of gas at the Union Workhouse, Withington.—W. N. Edgill, Clerk to the Guardians, Union Offices, Grosvenor-square, All Saints', Manchester.

LEES WATERWORKS.—October 30.—For the labour in building about 3½ miles of boundary-wall at Swinety Reservoir.—C. A. Curwood, Town Clerk, Leeds.

NORTH-EASTERN RAILWAY.—November 2.—For the construction of the Knaresborough and Borough-bridge line.—C. N. Wilkinson, Secretary, York.

NORTH-EASTERN RAILWAY.—November 2.—For the construction of Leeds and Wetherby line.—C. N. Wilkinson, Secretary, York.

MONMOUTH RAILWAY AND CANAL COMPANY.—November 1.—For the supply of two six-wheeled coupled-tank locomotive engines.—George Harrison, Secretary and General Manager, Chief Office, Dock-street, Newport, Mon.

WALTHAMSTOW, Nov. 3.—For the enclosure of their new burial ground, by oak park pale fencing, about 5ft. 6in. high.—William Houghton, Clerk to the said Board, 15a, S. Helen's-place, Bishopsgate-street, London.

IRELAND, Oct. 30.—For erecting and completing a new barracks for the Royal Irish Constabulary at Rochfort-bridge, County Westmeath.—Mr. Edward Hornsby, Secretary, Office of Public Works, Dublin.

HAVANT, Oct. 30.—For the erection of national schools.—Architect, Mr. J. W. Pinfold, No. 17, Parliament-street, Westminster.

WYMONDHAM CHARITY, November 6.—For repairs and alterations to the Chapel of S. Thomas a Becket.—Mr. E. J. Howlett, Solicitor, Wymondham, Norfolk.

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Do. do. 12 by 7	1 18 6	13s.
Do. do. 12 by 6	1 7 6	11s.

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„ ground in oil	do	0 0 0

	COPPER.	
British—Coke & Ingot	per ton	£74 0 0
Best Selected	do	76 0 0
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Spanish Calce	do	68 0 0
Chili Bars, cash	do	67 5 0
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	IRON.	
Pig in Scotland, cash	per ton	£3 2 7½
Welsh Bar, in London	do	7 15 0
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Staffordshire	do	8 15 0
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Hoops, first quality	do	10 0 0
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	OILS, &c.	
Seal, pale	per tun	33 10 0
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Olive, Gallipoli	do	51 0 0
Cocunut, Cochinchina	do	50 0 0
Palm, fine	do	38 0 0
Lanseed	do	34 0 0
Rapeseed, Eng. pale	do	47 0 0
Cottonseed	do	33 10 0

	TIMBER.	
Teak	per load	12 10 0
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„ yellow pine	do	4 5 0
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„ birch	do	3 15 0
„ elm	do	3 10 0
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Memel fir	do	3 0 0
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Swedish	do	2 0 0
Masts, Quebec red pine	do	4 0 0
„ yellow pine	do	4 0 0
Oregon	do	7 0 0
Lathwood, Dantzic, fm.	do	3 0 0
St. Petersburg	do	5 10 0

Deals, per C, 12ft. by 3 by 9in.	12 0 0	18 0 0
Quebec, white spruce	12 0 0	14 0 0
St. John, white spruce	12 0 0	14 0 0
Yellow pine, pr reduced C	18 10 0	20 0 0
Canada, 1st quality	13 0 0	14 10 0
2nd do	12 10 0	14 10 0
Archangel, yellow	12 10 0	13 10 0
St. Petersburg, yellow	6 15 0	7 15 0
Finland	0 0 0	0 0 0
Memel and Dantzic	8 10 0	10 10 0
Gothenburg, yellow	8 0 0	9 0 0
„ white	10 10 0	12 10 0
Gefic, yellow	8 10 0	12 0 0
Soderham	10 0 0	12 10 0
Christiania, per C, 12ft. by 3 by 9in., yellow	7 0 0	8 0 0
Other Norway	0 0 0	0 10 0
Flooring boards, pr square of lin., first yellow	0 8 0	0 9 0
First white	0 6 0	0 8 0
Second qualities		

BANKRUPTS.

TO SURRENDER IN LONDON.

Charles Henry Trew, Elliott-road, North Brixton, builder, November 2, at 12.
George Willsmer, Vicarage-road, Leyton, builder, November 7, at 11.

TO SURRENDER IN THE COUNTRY.

James Rigby, builder, November 2, Bolton.

PUBLIC EXAMINATION.

November 14, S. Richards, Falmouth, builder.

DIVIDED MEETINGS.

November 17, J. Ratcliffe, Stafford, builder—November 17, J. Gettings and G. Cox, Bilston, ironfounders.

SCOTCH SEQUESTERINGS.

Robert Gillies, Cambuslang, joiner and grocer, October 28, at 12—Donald Munro, Edinburgh, engineer, October 28, at 2—William Henderson, Edinburgh, mason, October 23, at 12.

PARTNERSHIPS DISSOLVED.

Rock & Cross, Spratslade, Staffordshire, builders—King & Pickles, Halifax and elsewhere, masons and bidders.

BREAKFAST.—EPPS'S COCOA.—GRATEFUL AND COMFORTING.—By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills.—"Civil Service Gazette." Made simply with Boiling Water or Milk. Each packet is labelled—"JAMES EPPS & CO., Homeopathic Chemists, London." Also, makers of Epps's Milky Cocoa (Cocoa and Condensed Milk).

THE BUILDING NEWS.

LONDON, FRIDAY, NOV. 3, 1871.

MODEL HOUSES FOR THE INDUSTRIAL CLASSES.*

NOTWITHSTANDING the many attempts at "model" building which the past thirty years have witnessed, it cannot be said that any one set of plans has so far justified its title as to command general imitation. And yet plans are plentiful enough. Every benevolent builder has considered it a bounden duty to give the world some new "model" that should outvie all its predecessors and leave no room for future improvements. At the late Economic Museum of Mr. Twining, at Twickenham (the destruction of which by fire is a real calamity to social science itself), we have been able to study an almost endless variety. And yet there were none there which we could recommend as an investment on ordinary paying principles, or which we could think the working classes would have chosen for themselves had they been consulted in the matter. It must be sorely disappointing to the benevolent persons who have spent both labour and money in this direction for so many years to find that the dwellings of the people remain pretty much as they were, overcrowded and unwholesome; that their much-praised models are not imitated by independent persons; and that the general sentiment of the working people remains, as ever, hopelessly against them. And yet every one of these model plans contains vast improvements upon the common habitations of the people. From the simple sanitary point of view they are highly successful, and the number of conveniences they pack into small spaces is truly wonderful. The main cause of their failure to attract the investing classes is their generally expensive construction. Mr. Fletcher quotes, as the cost per room of existing model buildings: Victoria Lodging House, nearly £60; Columbia Square, £106; Rochester Buildings, over £96; and Peabody Square, over £113; while ordinary builders, working with the disadvantage of borrowed capital, build at a cost of £31 per room. Here, of course, is the great reason why these block buildings do not pay, and why the proprietors get dividends of such uninviting amounts as warn all other capitalists from treading in their footsteps. Another cause of their failure is their want of adaptation to the feelings, wishes, and habits of the inhabitants. Most of them are huge hives, containing such large numbers that privacy is next to impossible, and a superintendent is necessary, whose continued interference makes the inhabitants feel rather too much like inmates of a public establishment, and prefer any miserable tenement where their actions are comparatively uncontrolled. Such mistakes are typical of English philanthropy, which gives on a princely scale, but too often fails for want of complete sympathy with its objects. Many of the gentlemen and ladies who have erected model dwellings have not cared for profit, and, of course, they have not got it. They have had a great and creditable sympathy for the working classes, and a real desire to give them homes fit for human beings; but sympathy with their feelings, habits, and prejudices could be expected only from their own class, or from persons brought into every-day close contact with them.

The fact is the building of improved dwellings is no work for philanthropists at all. The artisan can afford to pay, and actually

does pay, for his present uncomfortable tenement a price which should give him every convenience and comfort, and that these are not supplied in the ordinary way is a real discredit to the building profession. We are sure that if our friends would expend upon the humble subject before us but a tithe of the skill, time, and intellect which are brought to bear upon designs of palaces, theatres, town-halls, and cathedrals, the result of their labours, though not so dazzling, would be infinitely more beneficial to the community at large. It is, therefore, with the greatest satisfaction that we welcome the present very practical and excellent book upon the subject. Mr. Fletcher treats the subject in a very business-like way indeed. His first chapter is devoted to an examination of the defects of existing plans, the Waterlow plans coming in for special condemnation on the general grounds of their extremely narrow staircases, the great loss of space in passages, the awkward shape of the rooms, and the darkness of the living rooms, on which the tenants say the sun scarcely ever shines, and even in summer for only a short time. The external staircase is open to the great objection of not being able to get into the street or leave any one set of rooms without passing neighbours and strangers, shoulder to shoulder, besides destroying the sense of privacy by giving a close view into the rooms to passers-by. The external balcony is also a source of great darkness to the rooms. These remarks are just, and might be greatly extended. But it is time we inquired of Mr. Fletcher what he has better to show us. Our illustration (Nos. 1 and 2) exhibits the elevation and ground plan of a group of dwellings recently erected by Mr. Fletcher at Pentonville. He tells us they have answered extremely well, every set of apartments being let on remunerative terms. It is a great recommendation of the elevation that there is nothing to call attention to the fact that the same building is occupied in common by more than one family. It is a quiet unpretending building of brick, two stories high, with cement dressings, and arranged in what is called the "cottage" style, *i. e.*, the door in the centre and a room on each side. Nothing, save the unusual depth of the structure, reveals aught at variance with the idea that the house is the residence of some respectable member of the "lower middle" class of society, and this effect is further supported by a low dwarf wall in front with stone coping, surmounted by a simple iron bar and standards. The plan is peculiarly good. We have met with no other so simple, with such well-shaped, spacious, airy, and light rooms, and containing every convenience that has been attempted in the most successful of previous "models." A passage runs the whole length from front to back, secures a thorough ventilation throughout the entire floor, and gives access to four sets of apartments only. From the centre and to the right of this passage rises the staircase, spacious, well-lit, and so contrived as to present no awkward angles or corners, and landing in another passage, which, running exactly over the one on the ground story, contains in like manner the entrances to four more sets of apartments. Each set of apartments contains four rooms, one of the bedrooms being so planned that while access can be had from the common passage should it be desired to be let separately, a door can readily be made opening from one bedroom to the other, should it be required for occupation by members of the same family. The situation of the water-closets, &c., is exceedingly well planned for airiness, privacy, and the extrusion of smells from the building. Coals and dust are equally well provided for.

The humbler class of artisans are obliged to content themselves with more stinted accommodation, and Mr. Fletcher accordingly presents us with a series of designs for two-roomed dwellings, all characterised

by the same simplicity of adaptation we have noticed. We give an elevation and plan of one of these (Nos. 3 and 4). In these the staircases are well lighted and ventilated, and the covered balcony upon which the water-closets, scullery, &c., are made to open, provides amply for every sanitary purpose. This is about the most economical of Mr. Fletcher's designs. He would prefer others, which he gives, as being slightly more ornamental, and containing a few more conveniences.

But, after all, the only way of dealing largely and effectively with the question is by the adaptation of existing houses. We know that many practical men raise great objections to this, and would far sooner pull down a house entirely than attempt alterations. We think this is a mistake. The bulk of the London poor live in houses that have been vacated by the richer classes as the tide of fashion has set steadily westward. Drury-lane and its purlicus was once the abode of wealth, and is now the abode of squalor, because as the rich left the houses the poor huddled in, without any alteration or adaptation of them to increased numbers. The same process is gradually taking place in other neighbourhoods of more favoured S. James's, and unless we make up our minds to adapt existing houses to altered circumstances, a future age may have to speak of May-fair and Belgravian slums with the same shudder that comes over us at mention of S. Giles's. But even new houses that are erected for occupation by artisans are built as though the whole place was to be occupied by a single family of the middle class, and the inconveniences entailed upon the occupants thereby are so great that they are borne only because long habit has inured them to bear with rather than complain of them. Mr. Fletcher gives us a very great variety of suggestions for alteration of existing buildings, all apparently very practicable, but for which we must refer the reader to his book. We, however, extract one specimen (Nos. 5, 6, and 7), in which he proposes to convert a street of a very inferior class of property—namely, houses having a frontage of only 12 feet within the walls. He would do away with every third house, making such third house into scullery, with kitchen range, sink, &c. The front portion he devotes to three lobby entrances, one for each of the ground-floor flats, and the third lobby for the two upstairs sets of flats, which are reached thence by stone staircase, the under part of which is utilised for coal closets and lobbies to sculleries. The existing back parlour fireplace and chimney-piece remain for one scullery, and for the other scullery a fireplace is built as shown. There are several other alterations of partitions, doorways, staircases, and windows, which will be best understood from the plan. There can be no doubt that some such mode as this of dealing with existing houses would at once get rid of many of the disease-propagating localities which, in spite of the Building Acts and vigilance of sanitary officers, have been allowed to spring up all round us; and if, as Mr. Fletcher maintains, it can be done at a remunerative price, the sooner the work is set actively about the better. It is time, therefore, to examine his statement of cost and rental. With respect to his first plans (see Nos. 1 and 2), he says:—"My client determined to build one-half the block, for fear of non-success as to letting, and the total cost, including architect's fees, was £1,118. . . . The half includes two of the bay windows shown and one entrance door, and comprises eight distinct homes, each having plumber's water-closet, sink (water laid on thereto), range, coal-cellar, and cupboard. The sizes of the rooms are also marked on the plan. The present rentals are 7s. 6d. for the back sets, and 8s. 6d. for the front sets, thus giving a gross rental of £166 8s. per annum. I should mention the rental is put too low; but they were finished building at a depressed season, and the gardens could not be formed,

* "Model Houses, being a review of the defects of existing houses, with registered designs by the author for model houses from which buildings have been erected; and registered plans for the adaptation of existing dwelling-houses for letting in flats." By BANISTER FLETCHER, Assoc. R.E.B.A. London: Longmans.

because a part of the land required was not vacated, and to prevent any risk of their not letting, the rent we considered fair value—viz., 10s. each set—was not asked. The result was, that at the rentals of 7s. 6d. and 8s. 6d. the sets let before the building was finished, and dealing even with this low rental the result is—

Eight sets:—	Per Week.	Per Year.
Four at 7s. 6d.	1 10 0	
Four at 8s. 6d.	1 14 0	
		£166 8 0
Deductions:—		
Apportioned ground rent	27 10 0	
Collection, 2½ per cent.	4 3 0	
Rates and taxes	28 0 0	
Repairs, say yearly	8 0 0	
		67 13 0
		£98 15 0

To return interest at 5 per cent. per annum we require only £55 18s., so we get more than 8½ per cent., as that sum would require only £95 0s. 7d., leaving a surplus £3 14s. 5d." So far Mr. Fletcher's practical experience. He next enters into minute calculations (into which our space forbids us to follow) of covering a plot of ground of four acres purchased at £1,000 per acre, with two-roomed tenements, partly like our illustration (Figs. 3 and 4), and shows a probable return of over 8 per cent. His calculation of the cost of a building like the one given is £350, or nearly £44 per room (not charging for balcony or scullery).

	Per Week.	Per Year.
The rental of ground-floor sets at 5s. 3d. each	0 10 6	
Ditto first-floor sets at 5s. each	0 10 0	
	1 0 6	53 6 0
Ground rent at 4s. per foot frontage... ..	7 4 0	
Rates and taxes	9 0 0	
Collecting	1 7 0	
Repairs	4 0 0	
Empties and loss of rent	2 14 0	
		24 5 0
		£29 1 0

Being a net yearly income of nearly £8 10s. per cent. on capital. These extracts must suffice for the present to show the very practical and common-sense nature of Mr. Fletcher's work, which we cordially recommend to the attentive study of our readers.

THE NEW LAW COURTS.—IV.

(Concluded from page 299.)

THE EAST, OR BELL-YARD, FRONT.

IN this front—the eastern front of the range of building that closes in the quadrangle towards the east—of which the distinguishing characteristic is a dignified simplicity, the uniform line of the plain ridge of the roof is broken only by one entrance-tower, and the equally plain uniformity of the parapet is interrupted only by the same tower and by four gabled compartments. The completion of this front towards the south, where it will be connected with the clock tower, remains at present undecided. This front, in its existing condition, which is complete almost to the south angle, may be briefly described. In the basement there are, either in pairs or placed singly, thirty windows with square heads beneath pointed relieving-arches. The first story contains fourteen larger windows, slightly rounded at the head, six of them having corresponding window-arches, and eight being covered by more elevated pointed arches; also five smaller windows at the south end, their openings square, their pointed relieving-arches cusped, and with these windows those above them in the second and third stories are identical in treatment. More to the north, the range of windows in the second story is quite plain, while those above them have cusped relieving-arches. The windows of the uppermost range, for the most part grouped in pairs, are trefoiled; these windows are divided by very bold wall-shafts with sculptured capitals, which are repeated at uniform distances from end to end, except under the gables and in the tower, and they rest upon a continuous belt of enriched panelling. There are two pairs of gabled compartments, in treatment very nearly uni-

form, except that one has an entrance doorway. These compartments, one pair of them near the north end, and the other adjoining the entrance-tower, are somewhat advanced, and their gables, without windows, spring a little above the parapet-line: each of them contains, above the basement, four tiers of two-lights—the openings square, the lights shafted, the window-arches cusped and having varied enrichment. There also are three oriels corbelled above the second story, each having two tiers of windows corresponding with the second and third tiers in the gabled compartments. Again, to the south of the tower, there are three uniform bays, in each three transomed three-lights—the heads of the lights square, beneath unpierced panelling, tracery, and canopies. All these more important windows light the rooms of Masters and other officials of high rank, or those of chief clerks. The entrance-tower, placed somewhat to the north of the centre of the front, and boldly advanced, has an attached stair-turret to the south, and rises one story above the parapet-line: its own plain parapet supports a pointed roof, not of very high pitch, with a finial. Beside the entrance doorway is a double three-light window; above them are two transomed five-lights, one above the other; to them succeed, divided by a zone of five-foiled wall-arches, two tiers of arches, three in each tier, those in the lowermost tier pierced for windows, and those in the uppermost tier pierced only in the arch-heads. At the north-east angle of this front the finely-varied outline of the north-east tower is seen over the roof with admirable effect. In this front there are nine chimneys.

EAST FRONT OF THE QUADRANGLE.

This front, which faces the quadrangle on its eastern side, looks towards the west, and it forms the western face of that range of building of which the Bell-yard front forms the eastern face. About the centre, the line of this front is interrupted by a group of three gabled compartments, of which the central and largest compartment has the boldest advance. Each of the gabled compartments, their gables having their own lights, contains ranges of windows corresponding with those in the similar compartments in the Bell-yard front. In this front there are two oriels corbelled above the basement, each containing two tiers of three-lights, the openings square beneath cusped relieving-arches, and two similar oriels corbelled above the first story, and containing a single three-light only. All the other windows of the upper two stories are grouped in pairs, with the shafted arcade continued between the windows. The windows of the basement and the first story are quite plain, and those next above them have plain pointed relieving-arches.

WEST FRONT OF THE QUADRANGLE.

This front faces eastwards, closes in the quadrangle towards the west, and is the eastern front of the main block. Like the front opposite to it, it has a central group of three gabled compartments, in which are the corbelled three-light oriels of two of the judges' rooms, with a four-light and two single-light windows, all corresponding, interposed between them on the line of the second story. On the same line are three more judges' two-light oriels; a judges' entrance and staircase windows—two large and lofty traceried two-lights; the corbelled oriel of the Master of the Rolls over the double archway opening from the quadrangle to the corridor which traverses the main block from east to west to the north of the central hall; and the two projecting flights of officers' stairs. The basement windows are square; those of the first and second stories, divided by a belt of panelling, are slightly rounded in their heads, the latter having pointed relieving-arches. The windows of the upper two stories are grouped in pairs, with continued wall-arches as on the opposite front. The crested ridge of the roof has two levels

only, and from it there rise twelve chimneys. The parapet is plain, with an enriched cornice; and the gables are pierced with narrow lights and a six-foil within a circle. This front, like each of the others, possessing features peculiarly its own, is in perfect harmony with the other fronts of the quadrangle.

INNER NORTH FRONT OF THE QUADRANGLE.

On its south face, the building that closes in the quadrangle towards the north has a corbelled oriel, the corbel shafted, above the double entrance-archway, with two tiers of trefoiled two-lights, divided by a belt of sculpture. More to the east are three tiers of windows, four in each, the windows in the upper tier being two-lights; still higher, beneath a plain parapet resting on one row of corbels, a wall-arcade of eleven shafted arches has seven of its arches pierced with narrow trefoiled single-light windows. The design for the opposite inner front of the quadrangle—that on its south side, which faces to the north—has not yet been decided.

THE COURTS AND SOME OF THE LESSER FRONTS.

The Courts.—While they have other parts of the building abutting on their two ends, that is, behind the bench and in front of it, the courts are lighted on each of their two sides towards the adjoining open light-areas by a range of three large and lofty windows of two cusped lights, surmounted by a richly-cusped circle in the window-head; this arcade is continued both ways by corresponding arches not containing windows. On the exterior, over the masonry of these windows are lofty arches of brick, which are connected and carried by similar arches forming a pointed intersecting arcade, beneath a parapet which is embattled and weathered. In each of these exteriors of the courts are three other windows, severally level with the judges' corridor, the attorneys' corridor, and the corridor of the lower offices. The arrangements of the eighteen courts are nearly identical, and their thirty-six lateral elevations are nearly the same. Each court in the interior is rather more than a cube of 32ft. the actual measurements being: height, 32ft. width across the face of the bench, 31ft. 9in. and length to the back of the public gallery 39ft. 3in. The bench is approached by the judge through his own lobby from the judge's corridor. Each court is also lighted by skylight.

Witnesses' Stair Turrets.—The designs for the exterior of these turrets, eight in number, four of them polygonal to the west of the Central Hall, and the other four on the east circular, are compositions of extreme beauty, closely corresponding in their general character, with some variations in the detail. Each turret has a lantern with a range of windows and a conical roof and a finial; and as they wind round the central newel in each turret the stairs are accompanied by two tiers of most graceful windows, which ascend with them. The external width of these turrets is 20ft. 6in. Opposite to each of these stair-turrets, on the other side of each open light-area, the composition exhibits five tiers of windows, two in each tier, varying in their character, in keeping with the range of the corridors and rooms to which they give light.

ELEVATIONS IN THE LIGHT-AREAS ADJOINING THE CENTRAL HALL.

In the light-areas, twelve in number which encompass the Central Hall, at a distance from it of 26ft. 6in., the elevations facing the hall show five ranges of windows, with two, three, and four windows in the successive tiers, with intervening strings also, and a simple parapet, slightly embattled. All these compositions, and many others besides them, display much skill in treatment, and a remarkable variety of detail, and they constitute by no means the least pleasing features in the general design.

THE SOUTH OR STRAND FRONT.

This, the principal front, though very far from being the only one—"the front" of the building, in more than a few important particulars still awaits the final decision which must precede a complete and completely-satisfactory critical description; meanwhile, however, it certainly is desirable to give a general sketch as well of the central parts of the composition of this front, which will undergo no further change, as of those other parts that in all probability may be added to them; it is scarcely necessary to add that the full effect of the central parts of the composition as a whole must in no slight degree depend upon those other parts by which they may be flanked towards both the west and the east.

Like the Carey-street front, this Strand front comprises a front of the main block and southern fronts of the quadrangle and of the range of building to the east of it. The front of the main block, again, so far resembles the corresponding front towards Carey-street, that its own central feature is the principal entrance, on either side of which the balance and uniformity of the component parts are as complete and perfect as possible. The south end of the Central Hall, most happily introduced into this composition, is set back nearly 60ft. from the line of the front, in order to obtain for it an increase of light, and at the same time to enable so lofty a building to be seen with good effect from the Strand. Flanked by two octagonal angle-towers of striking character, 155ft. in height, in the centre of the end of the hall is the great window, its group of a tall three-light between two distinct yet united single-light windows covered by a vast arch of three enriched orders, the jambs low and shafted. Above this window, from a zone of embattled arched-work at a height of 105ft. rises the great gable, pierced with a circular window of geometrical tracery, 6ft. wide, the wall plain, the finial crowned with a statue. Below the great window a very bold arcade of pierced and canopied arches ranges above the principal entrance-archway. This archway, which is triple, of three shafted orders, beneath a beautiful scutellineal canopy without crockets or finial, and between two richly-traceried and canopied two-light windows. The interval between the actual hall entrance and the entrance from the Strand itself is occupied by an inner and an outer vestibule, both of them vaulted, and having their own entrance-archways and side windows. From the Strand on each side of the central line are seen the vestibules, their finials supporting statues, of parts of the building immediately adjoining the vestibules. On either side the outer entrance is flanked by an octagonal turret, close to a tower of the same form, the latter 80ft. high, and 110ft. high. Both are of great beauty, and with admirable skill they are grouped with the other, with the adjoining parts of the main building, and with the angle-towers of the hall. These turrets and towers severally contain the flights of stairs for juries and witnesses. His designs for these towers have very recently been completely recast by Mr. Street, and now they are certainly second to no compositions of their order in every highest quality of architectural excellence. To the west and east of these towers the range of building has three compartments of four stories, very nearly uniform in their details, and in their general effect the exact counterpart of each other. Some variety in the character and arrangement of their windows may be seen in each of these compartments, and also in their decorative members, but all have been carefully studied and are thoroughly appropriate and effective; each outermost compartment is further distinguished by being gabled, and having its gable flanked by a pediment and corbelled tourelles. The exterior tourelles of these two gables also bound the Strand front—extending 288ft. 6in.—of the

main block of the building. To the east the front is continued by a range of three archways forming the entrance to the quadrangle, over which is a broad belt of panel-work and sculpture, surmounted by an arcade of five arches opening to the corridor of the south bar-room. Above the arcade is a string, and then the composition is completed by a group of three gables with crockets, their finials crowned by statues; the central gable is pierced with a richly-canopied three-light window, while in each of the lateral gables there is a similar window of a single light.

Further to the east, to complete the south front of the quadrangle, to complete also the entire range of the Strand front in that direction, the design still remains under consideration. Criticisms, consequently, whether favourable or adverse, must be somewhat premature. The completion of the design for this front towards the south-east must in a great degree be influenced by the clock-tower, which will stand in or near the south-east angle. Thus much is certain—that this part of the Strand front will be essentially different from what was suggested for consideration in the photographs so well known by some of our daily contemporaries, and the change implies the most important and decided improvement. Mr. Street has made two designs for this part of the Strand front, which will be submitted for consideration to the Government. One design has a noble block of three compartments, five stories (including the basement) in each, grandly simple and truly dignified in character, which would adjoin the three archways that lead under their triple gables to the quadrangle. Beyond this block this design has an open space, succeeded by a magnificent clock-tower, with an archway leading to Bell-yard. The other design omits the open space, unites the new block to a clock-tower of great beauty, but of less height and considerably smaller proportions, and carries on the range of building one compartment beyond the tower. Either design in itself would be altogether satisfactory, and would tell most effectively upon the rest of the front. For ourselves, we should prefer the design last named, but with the greater in place of the lesser clock-tower introduced into it. On the west of the main block it is proposed to extend the Strand front westwards by a group of three archways under triple gables, corresponding (but not identical) with the quadrangle arches on the east, and also by a south-west wing, which would reproduce the very admirable block of three compartments, five stories in height, as it has been suggested in the former of the two designs prepared by Mr. Street for the other side. More particular and minute notices, with all detailed criticism, of this Strand front we leave till the design for the entire front shall be before us in a complete form. The appearance of the complete design we await in perfect confidence that it will fully realise all that we both desire and expect from it.

The designs of Mr. Street for the New Law Courts, which we have been describing, may be erected, according to the estimates that have been calculated, within the limits of £750,000, the last sum fixed by Parliament; this estimate, however, which includes everything else, does not include the greater clock-tower.

NOTES ON BRICKWORK.—I.

THE size of the mould in which common bricks are made is 10in. \times 5in. \times 3in. There used to be an excise duty of 5s. 10d. on every thousand common bricks that were made, and that size was fixed for the mould by Act of Parliament; larger sizes were charged with a higher duty, and bricks used for draining land were free of duty on condition that the word "drain" should be stamped upon them. Now, however, there is no duty or any limit to size, and some few brick-makers vary it, but the old size is still gene-

rally adhered to for convenience. In the process of manufacture a brick of this size shrinks about an inch in its length, half an inch in its width, and about a quarter of an inch in thickness, so that a well-burnt brick is reckoned to be 9in. \times 4 $\frac{1}{2}$ in. \times 2 $\frac{1}{2}$ in., and with $\frac{1}{4}$ in. bed joints makes very nearly a dimension in place of 9 \times 4 $\frac{1}{2}$ \times 3, four courses in height measuring a foot.

Different kinds of clay vary in the shrinkage, and some bricks measure when burnt only 8 $\frac{1}{2}$ in. in length, while others measure almost 9 $\frac{1}{2}$ in. The average dimensions, however, may be taken to be 9 \times 4 $\frac{1}{2}$ \times 3 in place in the work. A wall intended to be about 9in. thick is one brick thick; the next thickness is a brick and a half, or a 14in. wall; the next an 18in. wall, or a two-brick wall; the next a 2 $\frac{1}{2}$ brick wall; and so on for any other thickness, advancing by half a brick, or 4 $\frac{1}{2}$ in., at each increase of thickness; and it is not unusual to specify the thickness as so many bricks thick instead of by feet and inches.

The quality of the clay for brick-making varies much in various parts of the country. Some clays are found in which the ingredients that make the best bricks are naturally mixed; while in some parts good bricks cannot be made unless sand or other material is artificially mixed with the clay, for the purest clay does not make the best bricks—it is of too strong a nature, and however carefully the bricks may be burnt, they generally crack in the process of burning.

Both science and art are involved in the making and laying of bricks. By experience a brickmaker may judge pretty correctly when he sees a mass of clay in its natural position what sort of bricks may be made from it, or if he cannot, he can easily take a sample and try it; but in this, as in too many other manufactures, scientific knowledge of the subject is not thought to be worth acquiring, and the consequence is that workmen endure a life-long state of limited and narrow acquirements which have the worst effect upon their general welfare.

The physical sciences which relate to the composition and natural characteristics of the materials employed in manufactures ought to be understood by all who work them up. The science of geology teaches that clay of all kinds is the product of the slow disintegration of rocks by means of atmospheric action, and water-carriage to the place of deposit; and the science of chemistry teaches what ingredients each kind of clay is composed of; and the two together make it evident from what rocks any particular kind of clay has proceeded. Pure clay is supposed (we say supposed, because it is necessary in physical sciences to speak with caution, for new discoveries are often made in them, whereas in the exact sciences you may be as dogmatic as you please; as, for instance, in asserting that two and two make four—nobody will ever find that they make any other number) pure clay is supposed to be the product of the disintegration of primitive rocks in which felspar and mica are abundant, for both consist of the same or very similar elements—alumina and silica, with small quantities of potash, oxide of iron, and manganese.

Professor Ansted, in his "Elementary Course of Geology, Mineralogy, and Physical Geography," says of the clay group of rocks—but it may be well to say that a geologist means by the word "rocks" many other formations than the masses of stone commonly called rocks—"By the term rock, in geology, is understood any aggregation of minerals, or fragments of minerals, whether crystalline or amorphous (that is, whether of regular or irregular form), hard or soft, compact or loose, forming now an essential part of the mass of matter subject to our observation near the earth's surface. Rocks may, therefore, be mere mechanical heaps, presenting no structure, and nothing from which their history can be traced, or they may be mecha-

nical heaps arranged so that we can readily discover the law of their formation, or, finally, they may be so far modified by some rearrangement of particles—the result of chemical action—that the history they present is that of subsequent change, more or less obscuring the evidence of original formation. The vast majority of examples are of the latter kind. Rocks may be regarded in two ways, either as derived from certain crystalline masses, such as granite, presumed to be part of the original oxidised film of the earth before it became affected by atmospheric or aqueous agency, and thence called *primitive*, *endogenous*, or by other similar and significant names; or, as mineral substances accumulated at first in a manner more mechanical than chemical, and afterwards changed, by the action of chemical force, into the condition in which we now find them. The latter view is preferable, because it teaches us to proceed from the known to the unknown, and requires no statement of theory at starting. The essential minerals in all natural combinations on a large scale are quartz, limestone, clay, and water."

This being the definition of the term "rocks" as used by geologists, Professor Ansted proceeds to say of the clay group of rocks that under this title are included chiefly impure silicates of alumina. Common clay usually contains, besides silicate of alumina, a variable proportion of silica, iron, lime, and water, with traces of manganese, potash, soda, magnesia, and carbon, and being more frequently and more abundantly mixed with such impurities than either limestones or sandstones, some extent of change or modification can generally be discovered, even in the most mechanical and least-altered deposits. Under the general head of "clay" may be included a multitude of earthy minerals, whose base is hydrous silicate of alumina, but which presents admixtures of iron, manganese, lime, magnesia, potash, and soda, with free silica (or sand). The properties of silica, alumina, and water are variable, and thus the different varieties may be collected into groups. They are all amorphous (without regular form). Clays proper consist of "1. Kaolin, or porcelain clay; 2. plastic clay, or potter's clay; 3. brick clay, or loam, which contains a little lime, varying from 5 to 6 per cent., partly as silicate—most clays of this kind contain iron; 4. marl, which is the name given to clay which contains from 20 to 25 per cent. of carbonate of lime; 5. ochres; 6. bituminous clays, containing carbon."

The best kind of clay for building bricks is that which contains a sufficient quantity of sand, without containing too much, and very little lime. That which contains much sand is not sufficiently tenacious without the admixture of powdered chalk. That which contains carbonate of lime in lumps, even though they be small ones, is objectionable, because the carbonic acid of the carbonate of lime is driven off in gas by the heat when the brick is burnt, and the small lump of limestone is converted into quick lime, and quick lime has a great affinity for water or moisture, by receiving which it becomes slaked and converted into a hydrate of lime, and swells, by which action the brick in which the small lump of limestone has been allowed to remain is burst asunder and becomes unsound and useless.

These are little things of some interest as showing why certain effects apparent to everybody come about, and they are worth while inquiring into in order to guard against failure in constructive works.

When, therefore, clay that contains lumps of limestone is made into bricks it is necessary to grind it up, or to pass it through rollers set very close, so as to reduce the lumps of lime into powder and incorporate it with the clay. It is because that at many brickyards no machinery is employed, and because of the impossibility of separating to a sufficient extent these lumps of lime from the clay by

pedal and manual labour, that it has become an axiom that clay that contains much carbonate of lime is to be avoided in choosing a locality from which you will have bricks for use in any considerable work.

Other clays contain stones—rounded pebbles—and if these are not either picked out or ground up they will disrupt the bricks in the process of burning, by reason of the clay around the pebbles contracting when the water is driven off by heat, while the stone, in stead of contracting equally with the clay, is expanded.

DILAPIDATIONS.

LAY.

WHEN one considers the numerous arts and sciences that the professional man must have at least some acquaintance with, a list of which the reader will find given at some length by that grand old writer, Vitruvius, in the first chapter of his first book, is it to be wondered at that dilapidations are not more studied? The young architect too often revels in grand ideas, in designs for magnificent public halls, palaces, and churches, in perspectives giving impossible views (parenthetically one may remark that one finds older architects making perspectives on the same principle, especially some of those who send in their designs in competition), in laying out grounds with splendid stone and marble terraces, and endless flights of steps and fountains of gorgeous design, and lives in expectation of suddenly rising to the top of the profession, by some lucky chance or successful competition (that bane of the profession), and such an one invariably despises the slow laborious work by which our predecessors made their way into large practice; and consequently his success becomes a matter of grave doubt and pure speculation. But let us assume that the young architect and surveyor really desires to be well grounded in the practice of dilapidations, what are the books from which he must derive his knowledge?

First, of course, there is Gwilt's "Encyclopædia of Architecture," giving a general outline of the subject, and more than this could not be expected from such a book. Next there is that celebrated work "Woodfall's Law of Landlord and Tenant" (of which the ninth edition, by W. R. Cole, is, I think, the latest). Next, a valued work "Grady on Fixtures and Dilapidations" of which the second edition is the latest; and there is also the admirable report of the select committee of the Institute; this latter pamphlet, however, deals only with a portion of the subject. Omitting all consideration of the cost of these books, the reader finds that lawyers, writing upon the subject of dilapidations, not understanding in the least the practical part thereof, give a mass of information, so arranged; that he has to wade through the ponderous volumes to find the special point he is in doubt about. It does therefore appear, that it would be a most valuable assistance to the surveyor in his daily vocation if a brother professional were to put in a short and simple form the exact liabilities of persons to dilapidations and reparations; drawn from the latest precedents, and citing also what is the usual practice of the present day. It is proposed in the following chapters to do this.

With this view I will classify the different holdings, and show separately all the liabilities that can attach to every such holding. The first table will show separately all the rights and liabilities that attach to a lessor and landlord; the next separately all that attach to a lessee; and so on; yearly tenant; tenant-at-will; (I may mention an almost exploded kind of tenancy); tenant in fee simple; tenant-in-tail; tenant-in-tail after possibility of issue extinct; mortgagor, mortgagee in possession; tenants in common; joint tenants; coparceners; tenants for life; tenants for years without impeachment of

waste; so that at a glance the technical reader can find out what he requires to know and properly advise his client.

Often, in my own practice, has a client asked me what sort of dilapidations he was liable for, and no doubt this has occurred to many of my brethren; and how few can state positively the exact liability, or tell his client what reparations he must make under his peculiar holding to satisfy the dilapidations, and thus avoid a money payment.

One instance I may mention, which shows that solicitors themselves are uncertain or inaccurate. A client, who is a solicitor in large practice, had taken a house on a twenty-one years' repairing lease; and afterwards a builder, who was called in to see to the roof, reported that an entire new roof was necessary. I was then consulted, my client saying that if a new roof was wanted, of course that was not for him to do, but his lessor, and I had to point out that he ought, before he took the house, to have had it surveyed, to judge whether the roof and walls would last the length of the proposed lease; as he was bound to keep the house up, and therefore to keep the roof watertight, though, of course, not to put a new roof unless he could not otherwise keep the house water-tight. I purpose first to consider the rights and liabilities of the various parties; next the various covenants, with their meanings and value; then dilapidations and waste; going practically into what they are and how to ascertain them; and lastly I propose to give the duties of surveyors. And in closing this introduction to the subject, let me say that I shall be pleased to receive (addressed to B. F., office of the BUILDING NEWS), any suggestions, any particulars of peculiar practice, or any questions that the writers may be in doubt about, and may wish solved or ventilated (to use the slang of the day), so that every part of the subject may be thoroughly discussed.

Let not any reader think lightly of these tabulated forms which follow. They are the essence of much labour, and will save him wading through many volumes.

TABLE I.—RIGHTS AND LIABILITIES OF LESSORS AND LANDLORDS.

1. Not liable to repair premises where there is no express agreement or stipulation that they shall do so. (Note.—This applies equally to premises let to a yearly tenant, or let on lease.)
2. Not liable to rebuild, even though he has insured the premises and received the amount from the insurance office.
3. No implied covenant arises on a lease that the house is reasonably fit for habitation or occupation.
4. No implied covenant that it will last during the term.
5. Where the lessor agrees that he would first repair the messuages he *must* perform this covenant before he can insist on his lessee repairing, &c.
6. Where a sale of premises took place with a liability of the above (lessor) to do repairs at end of tenancy (a lease being running), it was held that in whatever way the lease was determined, or at whatever time, the liability *still* attached.
7. Where under covenant to repair all the *external* parts of the premises, and an adjoining house is pulled down which exposes party wall, and that wall fell down, it was held that he must rebuild, as the *external* parts of the premises are those which form the enclosure of them, and beyond which no part extends; and thus the decision made this class (the lessors) liable under the covenant.
8. Where the covenant is that in case of fire lessor would "rebuild and replace them in the same state as before the fire," he is *only* bound to reinstate them as they were when he let them, and not bound to rebuild any additions that may have been since granting the lease, erected by his lessee.

9. Where covenant to repair contains the exception "casualties by fire and tempest excepted," not bound to repair in either of the excepted cases. (Note.—Tenant, notwithstanding, continues liable to pay rent.)

10. Cannot be compelled to repair unless under an express covenant that he will do so.

11. Cannot be compelled to rebuild where premises are burnt down, although he may have insured the premises and received the amount of such insurance from the office, unless specially bound to rebuild in such an eventuality.

12. Covenants to repair usually have been construed in favour of lessors and landlords. (Note.—There is a change perceptible in very recent decisions inclining to a more liberal interpretation of covenants.)

It will be seen by comparing this table with the table of liabilities of lessees (Table II., which will appear in next week's issue), that the lessors and landlords have more rights and less liabilities. B. F.

THEORY OF THE ARTS.

ARCHITECTURAL COMPOSITION.—WOOD AND IRONWORK.

(Continued from page 302.)

BESIDES the strains or pressures to which the pieces themselves are subject, these pieces in their turn transmit the forces to the supports, which, therefore, must be able to resist them also. When, for instance, a load is not in the centre of the points of support, the pressure on those points will be unequal, and it will be necessary to apply the rule to find what resistance must be afforded by each support or wall, as well as that which the respective joints of the timber must afford.

In examining the earliest Gothic examples of the carpenter's art, we find an extravagant use of material, partly from the plentiful supply of timber, but chiefly from ignorance of the principle above enunciated. The old examples still remaining of Middle Age carpentry show that only the simple "compressive" principle of framing was understood; the pieces or timbers we find composing a roof truss were chiefly intended as struts or posts from the horizontal or tie-beam, which latter was of such a large scantling as to preclude the idea of a tie, but rather served as supportive of the uprights or posts. Indeed, if we compare an ancient roof truss of the ordinary construction over our old churches and a common truss of a king or queen-post construction, the intention evinced in the two cases is very different, the office of post in the one being supplanted by ties in the other. This conception or adaptation of the material shows clearly that the principle of the "tie" was unknown or hardly developed, the simple idea of compression only (which was so well adapted in the stone lintel, column, and arch) being still the predominant one. It was a long time, too, before the masonic idea gave place to that of scientific framing; in fact, from the manner in which we find collars and angle-braces and purlins framed into the main rafters or principals, and the scantlings and connections used, we have sufficient evidence to conclude that the principle of the truss or a system of composite construction was not understood. The short angle-pieces often seen under the collars were evidently intended to act as braces or struts rather than as direct ties; while the scantlings and proportions given to the cross-sections of rafters, &c., indicate a great ignorance of the fundamental laws of strength and strain of the material. Again, we find wooden pins and trenails used for pieces that could only serve as ties; the almost entire absence of iron in the connections, and the unsatisfactory joints adopted, making the art of framing timber of the period referred to a very imperfect one. From about the fourteenth century we find some splendid examples of roof framing in which the masonic compression

principle was acknowledged, as in some of the hammer-beam roofs. Although not expressed, the principle of the tie was somewhat adopted, the arch braces serving that office in connecting the triangular frames which compose the truss across the angles. The framers of such roofs, however, as that over Westminster Hall clearly show that weight and compression were only thought of, as in the above instance; the main arch braces are of such a scantling and design as to show they were intended to take the weight of the roof and throw it on the walls or corbels at some distance below the springing. Again, the upright posts which rest on the inner ends of the hammer-beams were intended to throw the weight of upper portion of roof on these beams, which, in their turn, transmitted the pressure to the ribs and wall-posts.

The roofs of Hampton Court Hall, Eltham Hall, Crosby Hall, &c., may be instanced as fine specimens of this class of framing, in which the compressive principle was artistically expressed in timber, and the tie ignored or skillfully disguised. A superior knowledge of construction is evidenced in these tieless class of roofs, and the principle adopted has never been since more artistically worked out.

The introduction of the tie in systems of framing, or at least its acknowledgment, constitutes a new phase in the development of the art of carpentry. This arose, doubtless, by the necessity imposed on the architect and engineer of roofing or bridging wide spans. In such cases the employment of a single beam of sufficient scantling was impossible, and the use of iron had hardly become recognised as a constructive material. Framed or trussed girders and roofs, combining an arrangement of struts and ties, of small scantlings or sections, gave rigidity with a minimum of material, and superseded in a great measure the employment of stone and brick as a constructive expedient. Sectional area of the material was reduced in accordance with mathematical theory, and the ascertained strength of wood and combinations of the material designed in strict conformity to the laws of statical construction replaced the old systems of framing the pieces, in which massive struts and arch ribs gave the required rigidity, though often very ponderously.

In the composition of the simple truss the art of construction may be said to be perfected, for in it we have the three forces which separately act and react in any structure or machine. These three opposite actions are mutually combined to form one simple beam. The truss may, indeed, be regarded as the germ of a system of architecture which will eventually supersede the simple repose of the compressive system, and a more economical one than even the arched or thrust principle ever gave. Greek architecture has been said to be the petrification of carpentry, but the science of framing, as perfected in the truss, required the knowledge of a mechanical proposition which the Greeks did not practically apply. It may be remarked, an analogy exists between the carpentry of civil and naval architecture—massiveness and size of timber in both giving place to lighter sizes and a principle of combining with the greatest advantage the several pieces; and this could not possibly have been attained without the advances made in mechanical science. As stated before, the tenons and trenails took all the strain in the earlier systems of framing, and the weights were taken by the cross or tie beams. When the tie was understood, we find the weights and strains transferred to the ties by struts in the direction of their lengths, never transversely; and we find that in a perfect truss this principle is carried out, and that the pieces composing it are only exposed to compressive and tensile forces. Thus, we have king and queen posts and their various struts receiving the main loads and pressures, while the main couples

or principals transmit a great portion of their strain to the ties. Cross strain being thus so much diminished, and being transferred into pulling and compressing actions, the economy effected in the material was something wonderful. The next step was to disguise as much as possible the necessity of a direct tie, and this is still one of the most interesting problems to which the attention of a student of construction can be called. The numerous examples of wide-span roofs without ties show the amount of success which has attended this effort, and also what may be realised. The substitution of an indirect or curved tie for a horizontal one has been ingeniously attained in several well-known examples by a combination of cross braces and curved ribs, in which case the inner or intrados line of framing is exposed to either tension or cross strain. The well-known laminated ribbed roof invented by De Lorme and adapted subsequently by Colonel Emy and others, is perhaps the consummation of a self-tied roof. It may be noticed that in most cases in which this class of trussing is adopted, the component parts of a truss are a series of triangular frames whose rigidity is secured on the well-known property of a triangle—viz., the unchangeable angles, the sides being fixed pieces. The lattice girder or rib is really composed on this principle, the upper pieces sustaining compression, the under tension. The laminated systems of roofing adopted at King's Cross Station and the Exhibition building of 1862; the Cannon-street Railway Station roof, constructed on the bow form, are also examples of this principle. Such bracing in effect constitutes a solid or compact shape, whose power of resistance may be considered analogous to a close-webbed girder of the assumed form. I need not multiply examples of this beautiful system of framing, which is destined to be widely employed. The use of iron has done much to secure the joints of framing, and its combination with wood for ties has developed a kind of construction which may ultimately be adopted with some artistic feeling.

Coming to the less mechanical uses of woodwork, or what is termed joinery, it will be needless here to refer to the multifarious requirements of building. The framing of doors, &c., the substitution of chanfers for mouldings, the gradual disuse of paint as a covering for internal work; and generally the adoption of a more rational method of treating the material, giving to its peculiar and intrinsic functions and merits, instead of disguising them, are steps that are leading in the right direction both in a constructive and artistic sense. If we take only one instance of this—namely, the improvement in church woodwork, the substitution of open and stained and varnished benches for the old pews, the more reasonable construction of the backs and elbows or ends, and especially the more truthful and artistic expression of purely constructive adaptation and material, there is enough to convince one of the universality of this material, and its use as an art-agent of the first order.

The propositions we may generally deduce from the foregoing considerations of this material are instructive, and should always guide us.

1. That it should be employed only in positions unexposed to alternations of temperature or inclemencies such as moisture and dryness.

2. That wood should be employed or adapted in the direction of its length for all constructive purposes, being that also of its fibre.

3. That the forces or strains to which it may be subjected in construction should, where practicable, be confined in the direction of its length or fibre, either as compression or tension.

4. Arising from these propositions, wood or timber should be confined to purposes where length and lightness are necessary.

5. That, agreeably to its physical constitution and behaviour, it should not be employed as a component of brick or stone walls in any other manner than for equalising pressures or weights. Its use for templates, bond, and lintels in brick or stone walls is objectionable, though for plates not entering into the composition of a wall it may be allowed.

6. That for tying-in and connecting walls, covering or roofing, or used as flooring, it is legitimately proper, also for fittings and purposes which require rigidity and lightness combined, or in which a non-conductive material is necessary.

7. That decoratively it should always be used where it can truthfully express its nature and properties, not as stone or plaster (carving may be excepted, though moulding is more rational; carving only, I think, being proper, the grain or fibre of the wood lends itself to that operation), chamfers or mouldings in the direction of grain and other artistic effects that do not destroy the fibre but rather express it, being allowable. Its combination with iron or other metal work may always be attained when each lends to the other its characteristic office or property, or where they both unite to some purpose of usefulness.

G. H. G.

PEDESTALS.

By THOMAS NORRIS.

(Continued from page 301.)

AT the London University building, in Burlington-gardens, the pedestal takes a prominent place as a strictly decorative feature, large and well-designed examples being made to range and vie with the seated statues of distinguished men by which the entrance-portico is adorned. Castiron, from its facility of ornamentation, has superseded wrought work for enclosures; but there is a general mawkishness of design with which such specimens as those on the south of the India Office, in Parliament-square, on the north of the Junior Carlton Club, and at the Prince of Wales's Office, at Buckingham-gate, contrast very favourably. Wrought iron panels, and small pedestals of stone with iron caps, at Somerset House, are indicative of the weak resources of Sir William Chambers's time, yet they are far more artistic than many pretentious specimens of recent execution. The breastworks of our chief modern edifices are usually, however, of stone. The clubs of St. James's especially attract attention, and in Pall Mall, the productions of Nash, Burton, Barry, Sydney Smirke, and David Brandon, are clustered like a constellation. The Army and Navy Club, by Messrs. Smith & Parnell, must not be forgotten, whether for its pedestals or Venetian origin, which seems also to have found the *motif* of the new Post Office, by Mr. Williams, of H.M. Office of Works. Nor must the Junior United Service, by Mr. Marsh Nelson. The latter architect has charged his pedestals with groups of cupidini, nude, robust children of Mars, with casques and "circumstance of glorious war," the naval service being indicated by dolphins on a shield, and a device that, by the modeller's ingenious rendering, may be a coronet and sceptre, or Neptune's holiday trident. Dolphins have always been favourite types of the ocean. A dolphin was matchmaker between Neptune and Amphitrite, and it may have some allusive significance on the cyma of Nerva's temple. But Neptune's proudest creation was the horse, and this he staked against Minerva's olive tree in their contest for the privilege of naming the capital of Greece. Mr. Spang* has embellished the screen in front of the Admiralty with both dolphins, naient sea-horses, and other emblems. The best artificial figure of naval merit is, however, the rostrated column. Mr.

Nelson has shown by his commendable example at the Junior United Service how advantageously such speaking decoration might be adopted in other of these sumptuous piles. The breastwork in front of the Home Office, having escaped Barry's *rifucciata*, stands as left by Sir John Soane, and invites a series of statues of distinguished Home Secretaries. They would, perhaps, be appropriately modelled *sejant*, with the existing pedestals for footstools. Passing from the base to the top of building, it may be noticed that while the mansard or curb roof is nearly as common here as in France, the Metropolitan Building Act obliges us, in a general way, to place it behind a wall or parapet, and thus disguised, the identity is lost. With us, therefore, the parapet becomes an object for ornamentation, and the balustrade, with piers and pedestals, recurs. Nevertheless, the Travellers', Reform, and Junior United Service Clubs are finished with bold Roman eaves cornices. In most of the other buildings of this class balustrades occur, and in several there are well-marked pedestals, though these have rarely any object to support. Bridgewater House is an admirable example, and Somerset House is also remarkable for many excellences; but the great length of its river frontage, and the inequality of level between the foreshore upon which it abutted, and the Strand, caused some architectural difficulty, and the order has the disadvantage of a preponderant substructure. It was unquestionably a grand success for its time, but the bolder and more practised hands of modern artists would probably have secured a better sky line, it being one of the very few buildings in the metropolis where that line is of the slightest consequence. The upper balustrade has pedestals, charged in part with filleted urns, and in part left vacant. In the new west flank, Sir James Pennethorne has surpassed the Swedish knight and able originator. His central attic is more elevated, which allows for visual depression, and besides the elaborate tympanum and frieze, the elegant statues that occupy the pedestals of the balustrade impart an eminently architectonic and finished character. In other than domestic structures, pedestals are freely and advantageously introduced. They terminate the retaining walls of Trafalgar-square, erected by Sir C. Barry, those on the north being bold masses of quadrangular plan, and those at the south taking a cylindrical form. The tambour, with its sweeping cap and base, proves very effective, and the prismatic octagonal lamps by which they are terminated are original and appropriate. Were other squares enlivened with a few pedestals, and guarded by enclosures of moderate height and graceful forms, were the areas too, arranged and decked with taste, how inspiring, how bright and healthy would be the change! A movement of the sort has indeed been initiated at Grosvenor-gardens, Pimlico, that, if properly followed, would utterly metamorphose the aspect and enhance the value of many a now dank and dismal plot.

The art result of parapet and pedestals is marked in Mr. Bazalgette's Thames Embankment. The elements are characteristically severe. One cube of granite is set upon another, the second receding a little for the sake of a plinth line, and having a hollow moulding round the top. Upon the face of the upper cube is a bronze lion-mask holding a massive ring, about which a semicircular rebate is made in the plinth. Often as this design is repeated, it never becomes insipid. From the massive wall of granite, with the heavy tidal flood at its base, to the airy and light-giving lantern above, the transition is rapid; and the difficult task is at present incomplete. Of the larger, indeed gigantic, masses upon the Embankment, it also seems premature to speak. The designer, doubtlessly, knew their intended destination and significance. They obviously admit of noble

appropriation, but as yet their meaning is undeclared.

To overlook the artistic qualities of this great work would be as undiscerning as it would be uncandid to disparage them. On the Middlesex shore of Westminster-bridge one sees to the north the work of Mr. Bazalgette, engineer, and to the south, the embankment in front of the Palace of Parliament, by Sir Charles Barry, architect. Where, then, does the distinction between these vocations lie? Nowhere! So far as the intramural affairs of towns are concerned, the palaces, churches, and edifices of every kind thereunto pertaining, with their ways, and drains, and sewers, are properly within the province of the architect; and he who undertakes them enters that province and makes himself to such extent an architect. To what purpose, then, do one class of professors seek to impose shackles on a free art? The utmost success in that direction would but promote monopoly in small affairs, while the *bonnes bouches*, paid for in millions, would continue to be swallowed by engineers. The attempt to create these distinctions is as futile as the late pretensions of the Gothic school, that did so much towards professional disruption, and signally collapsed by the employment of the grand master of the order on the Government buildings at Downing-street, where the most English portion of the work is the inspersation of Jacobean by Sir Digby Wyatt, in the internal details of the India Office. The Corporation of London have a standing architect and a standing engineer, and cannot say who's who! The qualifications of these officers are the same—each is, in fact, an architect and a member of the Institute.

Bridges, too, have been wrested from their proper authors and devoted to the pretensions of science, with at least one appalling result. So keenly was the mean effect of the best of them felt when the heir-apparent ushered his bride elect into the metropolis, that the City, in a paroxysm of unwonted shame, immolated its architect in the attempt to impart to it for the nonce something of the tasteful guise in which it ought permanently to appear. Why should we be without one national object of the kind, one *Pons Triumphalis*, one exultant testimonial of virtue in arms, in commerce, arts, and "heaven-directed" civilisation? There is no excuse for shaving tastelessly down to the very quick of close utility the leading bridge of this grand capital, leaving it devoid of such accessory graces as would satisfy modern intelligence and atone for the absence of those picturesque qualities that are indelibly associated with a former London-bridge. We lack the art, it seems, to stamp our name, our age, and attestation on the work, and so, despairing, leave the cold arcade no more allied to London than to "Babylon or Great al Cairo."

FINE ARTS.

WINTER EXHIBITION OF CABINET PICTURES.—FRENCH GALLERY.

MR. H. WALLIS opened his usual Winter Exhibition of Cabinet Pictures by British and Foreign Artists on his premises, called the French Gallery, in Pall Mall, on Monday last. This is the nineteenth year of the enterprising caterer's speculation, and we understand that in its time it has been the means of introducing a large amount of floating capital into the picture market. We should be afraid to tell, for instance, what we have heard named as the figure reached by the sales at the exhibitions in this little gallery, winter and summer, last year; it was a sum, however, which if it did not attain to a hundred thousand pounds, went considerably more than half way towards it. Whatever the merit or importance of former displays, that of the present year is, we are compelled to say, undeniably below the average. Out of the 208 canvasses, chiefly of small dimen-

* Spang produced the anatomical figure with which life-students are generally acquainted.

sions, there are scarcely a dozen noteworthy for any degree of merit. The rest are weak and tawdry specimens of that class of product familiarly known as "furniture pictures," the mysteries of dealing in which are quite beyond our comprehension. Close to the door, however, is a very clever bit, full of humour, by E. Nicol, A.R.A., entitled, "Perplexed." With one hand scratching the back of his head, and the other thrust incontinently into his breeches' pocket, and some letters on the table beside him, the good old yokel wears upon his features an air of extreme bewilderment, plainly indicating "a mess" of no ordinary dimensions. A little further on we come upon two or three startling examples of the destructive influences of the money patronage as at present exercised upon art. "A Summer's Afternoon in Kent," a cow subject, is utterly unworthy of the talent by which Mr. Sydney Cooper, R.A., raised himself to eminence; his sheep subject is a little more respectable, as regards the sheep, but the landscape is very poor. Mr. T. Faed's (R.A.) "An Early Morning in Spring," representing a single female figure sitting on a bank, is weak and spiritless to a degree we could hardly have supposed in the painter of "His Only Pair." Mr. W. P. Frith, another R.A., must have acted under strong, doubtless friendly, compulsion, when he allowed himself to send for exhibition his miserable, ill-painted little "Amy Robsart" having her hair dressed; and Messrs. Ansdell and Le Jeune also step out from the Academy ranks with contributions which can add little to their renown. Mr. J. Pettie, A.R.A., however, displays considerable fancy in his "Haunted Wood," the expression of the two girls peering into the gloom being very nicely conceived. The portrait of Napoleon III, by A. Yvon, in an oval, taken in 1868, does not realise the astute expression we conceive of the distinguished original. A single clever and highly-finished little bit, by L. Alma Tadema:—"Pottery Painting," stands out conspicuously amongst a surrounding of absolute daubery. The figure, and keen appreciative glance of the young woman scrutinising the effect of a newly-painted vase, are happily rendered. "A Parisian Home, 1870," by M. T. E. Saintin, is a sad domestic scene, feelingly realised; in a similar vein, and not unsuccessfully treated, is the "Ou est Mon Pere?" by Mrs. K. Bisschop, representing a young widow, inspecting the portrait of her slain husband, with her child, who is unconscious of her early bereavement, standing beside her.

LOAN EXHIBITION OF DRAWINGS IN WATER-COLOURS.

There has just been opened at the Institute of Painters in Water-Colours, in Pall Mall, a most sumptuous and interesting assortment of paintings in water-colours, contributed by some of our most distinguished collectors, Messrs. Leaf, Quilter, Rücker, Lucas, and others, the proceeds of which will be appropriated in aid of the funds of the National Hospital for Consumption, on the separate or cottage principle, recently erected near Ventnor, in the Isle of Wight. There is thus afforded the opportunity, rarely obtainable, of studying the works of the best hands in this particular and peculiarly national field of art, from the days of its earlier triumphs to those in which we live. It was a courageous, but a generous thing for the Institute of Water-Colour Painters thus to throw open their walls to a display of the choicest specimens of the nineteenth century's production, within a few weeks of the time when their own annual exhibitions will be opened; but the feeling which prompted it cannot but be appreciated, and who knows but what the result in the end may prove to the advantage of all sound and worthy workers in their body, by improving the education of the public eye, and increasing the demand for high-class productions of their school?

Without pretending to go into any detailed criticism upon names and works which have already established their position in the history of art, we cannot help remarking, not without regret, how much in all the grand essentials of appreciation of nature, delicacy of feeling, and power of handling, the work of the past generation, say thirty years or more ago, surpassed the present. In figure painting, F. W. Burton, for elegance of contour, roundness and finish of his flesh texture, and charm of expression, distances all competitors; witness only his "Marchesa," "Faust's First Sight of Margaret," and "Tyrolese Boys Trapping Birds." Then how beautiful in their simple conception, but high in finish, are L. Haghe's interior groupings; how honest and spirited Cattermole's scenes of chivalrous life. In landscape we have a mine of wealth in D. Cox, grandly rough, and breathing every variety of life in his landscapes, but *soigné* and broad in his interiors, as in his two of Hardwick; and endless diversity in the honest treatment of Nature in J. Varley, P. DeWint, W. Nesfield, W. Bennett, Stanfield, and Turner. It is curious, also, and instructive, to look at the straightforward, substantial work of such a man as Birket Foster, in his earlier day, and compare it with the fritter of handling into which of late years he has too often degenerated. And W. Hunt, too! so inimitable for his little rough rustics, and his delicious fruit and foliage. When we add to the names already cited those of such men as G. Chambers, Copley Fielding, Prout, Muller, G. Bach, E. Duncan, N. G. Hine, F. Taylor, and J. F. Lewis, we say enough to indicate the high quality of the art entertainment now inviting public attention at this pretty little gallery. O.

THE INFLAMMABILITY OF LONDON.

THE *Times*, in an article under this head, contains much useful information, which cannot receive too much consideration:—

The first and one of the most serious of the risks to which London is exposed arises from the utilising of premises for purposes for which they were never intended. Houses erected for private dwellings have been converted into warehouses and manufactories; story after story has been piled up on walls never intended to bear them; space has been made by excavations, which shake the foundations, and basements designed for domestic kitchens have in hundreds of instances been converted into engine houses to work machinery on the upper floors. The next, and perhaps still greater, risk is the incongruity of the various businesses carried on beneath the same roof. This is by far the most curious phase of London commerce. Nothing but actual inspection can give any one an adequate idea of it. If the most accomplished incendiary were employed to arrange the materials for conflagration, he could scarcely succeed in placing them better than chance or necessity has done it throughout whole streets of territory. The general idea, no doubt, is that a warehouse is a warehouse only. Nothing can be more erroneous as regards the warehouses of London. You can hardly find one that does not contain a manufactory, and a manufactory of a dangerous kind. As a rule, whatever may be going on in the floors and lofts above, there is an extensive fabrication of packing-cases underground. Miners are not more numerous in Cornwall than packing-case makers are in the caves of the London warehouses. If there is here and there a cellar without them, it is occupied by coopers. It is scarcely necessary to say that in nearly every instance the work of both is carried on by gaslight. Look down beneath any of the great soft-goods warehouses, and the chances are ten to one you will see light timber, and shavings and binding laths in all directions, and jets of gas within a few inches of the ceiling. But packing-cases are indispensable, and so various are the sizes of the cases required every hour and every moment that it is found necessary to have them made on the premises. Packing-cases are so considerable an item in the expenditure of such warehouses that the firms themselves find it to their advantage to manufacture them. Where the house does not make its own packing-cases, people in the trade pay as much as £250 to £300 a year for a cellar close at hand which may, perhaps, be beneath an oil and

colour or a tallow store. We have seen a regular packing-case manufactory which is only divided by a narrow passage from one of the largest oil and colour stores in the city. In it are one or two large lofts filled with sawing machines, light wood, and bags of shavings; in a cellar beneath is the steam engine which works the saws, and overhead is a large apartment, to which access is had by means of a ladder and trapdoor, the manufacture of paper boxes in all its stages, including the drying and drying, is carried on. On this upper loft are a stove and hot-air pipes for drying the paper, and bags of paper shavings are piled up wherever there is room for them. Such is the difficulty of finding premises in the city that the dingiest cave or loft commands almost anything asked for it, and is rented without reference to the other trades which may be carried on above or below. Under such circumstances to tell a man that he ought to build new premises which would be in accordance with the requirements of the Building Acts is to tell him to suspend his business while his present premises are being thrown down and the new ones erected. It is a common thing to hear merchants say how much they could save in fire insurance and gain by an extension of their trade if they could only build, but the insurmountable difficulty we have just indicated stands in the way. It is curious to observe the shifts, and in many cases dangerous shifts, to which they are forced to resort. Where there is no room for wood inside it is piled outside beneath the windows of the building, and the binding laths of packing-cases are arranged in bundles along the entry, lengths up, just as if they had been placed for a bonfire. Again, nothing is more deceptive than the outward appearance of some of the warehouses. You see an imposing stone building, with the name of some well-known firm over the door, and you imagine that the limits of the stone block are the boundaries of the warehouse. But in all probability some portion of every house within half an acre of that imposing building is rented by the same firm, who have broken through party walls and burrowed out underground passages leading into streets at all angles with that in which they have their principal entrance and counting-house. Beneath one modest façade in the city you can obtain entrance to seventeen or eighteen different houses, a considerable portion of every one of which is occupied by the same firm and filled with their goods. And this is only a specimen case. In nearly all such instances the portions of those houses not rented as annexes to the warehouse are shops in which retail business is carried on, and over which neither the Building Act nor the merchant has any control. The use of gas is so general in many of the great warehouses that everything is done in them by artificial light. Some years ago it was estimated that the movable property of London might on any given day be estimated at 900 millions. It is believed that at the present day an estimate of 1,000 millions would not be above the mark. There is more than one private firm whose stock when full is valued for a million at cost price, and there is a wharf between Southwark and London bridges which rarely has at any hour less than that money's worth of consigned goods stored in its lofts. Half a million's worth is quite an ordinary stock for many of the water-side stores, and yet throughout the portion of the city to which we have been referring, the wharves and warehouses are stuck so closely together that a whole range of ten or a dozen of them can only be regarded as one, instead of what they ought to be, so many separate risks. Throughout the whole commercial area there are a very bad class of "fire traps," in the shape of houses composed either entirely of wood or of wood with some very thin brick walls between the framework. This adds immensely to the danger of London from fire. A man may build a house, the main portions of which are of un inflammable materials, but what will this avail him if he is surrounded by wooden structures? A building may be of un inflammable materials while the goods with which it is stocked are peculiarly inflammable. Again, material may be un inflammable, but by no means fireproof. In more than one of his annual reports Captain Shaw has drawn attention to the distinction between "un inflammable" and "fireproof," though, as he remarks, the words are often, but erroneously, used as synonymous. Thus, stone staircases are un inflammable, but he regards them as being anything but safe or fireproof. It appears that they soon become calcined by great heat and fall down in a heap, and so tend to frustrate efforts to extinguish fires that have made any head in the interior of the building. Iron columns are "un inflammable," but in the opinion of the same authority they are by no means "fireproof," when made hollow, as they are in this country. During the fire of Paris

it was found that iron columns stood well and supported the superincumbent weights; but, on inquiry, it has been ascertained that those pillars were solid, which makes all the difference. It will be seen, therefore, that even stone and iron will not stay the progress of a great conflagration if they are stocked with inflammable goods, and are in such close proximity to "fire traps" that they and the latter may be said to be one risk. Another danger to London is the narrowness of many of the streets in the commercial quarter. In his *Annus Mirabilis* Dryden observes how—

—"down the narrow streets it swiftly came,
And, widely opening, did on both sides prey;
This benefit we sadly owe the flame,
If only ruin must enlarge our way."

The poet's expectations as to an enlargement of "our way" have not been realised; and if such another fire broke out now during the business hours, the block of waggons which are in a long double line from morning till night would seriously embarrass the firemen. This is one of the reasons which influence the chief of our fire brigade to recommend that light manual engines should always be kept among the rolling stock of the fire establishment. Builders' yards choke full of timber are plentifully dispersed among the city warehouses. More perfect "fire traps" in such situations could not be devised. But, as in the case of the wooden houses, where is the remedy? The Building Act is not retrospective, and, perhaps, it would be going too far to compel a man to knock down a house which he was born in, and which suits his own business, because it is dangerous to the business of his neighbour, who has set up long after him. It might not be so unreasonable to give the Act a retrospective operation as against the owners of stores, warehouses, and manufacturing. We have mentioned that it is evaded even where it was intended to apply. Thus in order to remove their premises from the category of wholesale warehouses, merchants in some instances "break bulk"—that is, sell some article or articles by retail. Another means of evasion is by enlarging and altering under the name of "repairing." As long as it is the old house on which you are working, you may defy the district surveyor; but, as has been already explained, these evasions are the result of the exigencies of trade and of limited space rather than of any niggardly economy, or recklessness as to the danger of fire. It is worthy of remark, that some of the trades which are popularly supposed to be the safest are among the most dangerous. Thus, when people hear of a fire in an iron foundry, they are apt to conclude that it cannot do much harm. But an iron foundry is a heavy risk. For ten men engaged at the casting, there are, perhaps, as many as twenty employed at making the wooden models, and both these and a stock of timber, all as dry as matches, are kept in the same premises with the furnaces. Then a fire in glass stores is supposed to be a mere nothing; but firemen regard it with great apprehension, because in bulk of stock the crates and straw are usually about double that of the glass.

On examining the shipping and the wharves, and other waterside premises from Loudon-bridge down to the Surrey wood docks on the south side, and the Regent's Canal dock on the north, it is impossible not to be struck with the danger which lies lurking throughout the whole way. The trade of the port of London has grown out of all proportion to the safe accommodation for it. The buildings in the narrow streets and lanes on either side are literally upon the stores and wharves, and whole acres covered by the premises of different owners are for fire and its prevention nothing more than a single risk. Between the most valuable blocks of warehouses are old wooden houses to the number of hundreds, and, worse still, many wooden coal hoists, than which nothing is more dangerous. To economise time nearly all the large cargo steamers are loaded and unloaded by means of steam cranes. The vessels are brought up close to the wharf whenever there is room for them, and the engines are constantly puffing their smoke and sparks up to the doors and windows of the warehouses. The tiers of ships are necessarily so close and so surrounded by lighters that even on the river itself there is no small amount of danger. Coal hoists, wooden houses, lighters with railway sleepers steeped in creosote, and barrels of petroleum, are all within easy distance of flames breaking out in any one of them; and though the authorities of the port and the dockmasters do their best, the block of merchandise and the exigencies of time defy them. In a word, the danger of a general conflagration in London appears to be greater than in any other city, because in none other is there anything like the same amount of commerce of all kinds carried on within the same superficial area, and under conditions so

unfavourable to due precaution. It would be easy for social science philosophers to suggest theoretical remedies, but it would be vain for practical men to ignore the difficulties in the way of their adoption. A classification of trades, and the rigorous restriction of particular goods to particular stores and particular lofts, would no doubt do a great deal. But is that possible? Then, as to warehouses for the storage of inflammable goods, if each separate block could be made to stand entirely detached we should probably arrive at a "minimum" risk. But enough has been stated to show that such a precaution is out of the question. Buildings, the stock in which never could be entirely destroyed, might be constructed on the compartment system, but what chance have we of that? A partial attempt in that direction has been made by the introduction of metal doors under the Building Act, but at best they are only a slight security.

NO. 76, JERMYN-STREET.

THE building of which we this week give an illustration of the elevation towards Jermyn-street has been recently erected for the London and Provincial Turkish Bath Company, from the designs of Mr. Arthur Cates, of Whitehall-yard. The well-known Hammam or Turkish Baths, which were some few years ago constructed in the rear of the St. James's Hotel, under the inspiration of Mr. David Urquhart, and from the designs of Mr. George Somers Clarke, having proved a remarkable success, the directors of the company found it necessary to rebuild the front block so as to improve the access to the public baths, to provide additional accommodation for the service of the establishment, and apartments for the reception of those devotees of the bath who might desire to reside on the premises; the new building has been arranged to satisfy those requirements, and to utilise to the fullest a somewhat limited site by adopting a central staircase with corridor around on each floor, the architect has managed to provide a series of chambers generally arranged so that the bed can be placed in a well-ventilated alcove with separate entrance thereto from the corridor, and thus the one room of the bachelor resident satisfies all his requirements of a spacious sleeping apartment, and when not so occupied is by the judicious use of drapery to shut off the alcove, converted into a handsome sitting room. Great attention has been paid to secure economy of service by the arrangement of speaking tubes, fitted by Sheath, of 89, City-road, and of electric bells, fixed by Freeman, of 8, Vine-street, Piccadilly, by whom also the gaswork was executed—and the ventilation has been provided for by the liberal employment of air flues, generally formed by Boyd's flue plates and by the introduction of Boyd's hygienic stoves. The general contractors were Messrs. Kirk & Parry, of Sleaford; the masonry of the front is of Ancaster stone, and the red bricks supplied by Mr. Knight, of Woodbridge.

ART AS APPLIED TO MANUFACTURES.

ON Wednesday evening, Mr. J. H. Chamberlain, F.R.I.B.A., delivered a lecture on this subject at the rooms of the Royal Society of Artists, New-street, Birmingham. The lecturer said that his subject was only part of a large one; it formed a portion of what was called decorative art, which was not held in very high esteem by professional artists. He was sure that artists themselves would gain immensely by studying this art. Probably they were frightened by the decorator, who was, in fact, an undertaker for them whilst they were yet alive. He would polish, veneer, and varnish, but all he thought of was fashion and profit. He had set a sad example, which he was sorry the manufacturers had followed. He had set a good example, which he was sorry the manufacturers had followed. Yet decorative art could be of the highest service and use. It was self-sacrificing. Other arts obtruded themselves upon their notice, but the art of the true decorator was often lost sight of. It began in a low place and occupied itself with arrangements which they might say had very little to do with art. And yet artists recognised it as "composition." It was the basis of all simple ornamentation, but it did not stop there—it ran through all art, and in architecture especially was of great value. Speaking of the application of art to manufacture, the lecturer observed that the latter when worked on by the individual artist ceased to be manufacture. It was, therefore, most difficult to keep it good, and its goodness would depend almost entirely on the general state of art knowledge and love of art. For the successful application of art to the work which was subordinate to it, it would be necessary that there should be such a great spread of art power

so that even the ordinary workman might be able to produce manufactures which were essentially artistic. After alluding to the general advocacy of art, and the common arguments used in its favour, the lecturer said that in inquiring as to whether the spirit he had referred to prevailed, they might look at their streets and houses in Birmingham. Birmingham had never at its best been a very beautiful place, and he did not think it was getting much more beautiful. He thought that those old houses, with their gables and steep roofs, which their friend Mr. S. Timmins and the other members of the Archaeological Society were trying to preserve, were much better than a great many of the buildings they were getting in the place of them. They had certainly got a new street, but it had not a gable in it, and he did not think that in the matter of beauty, they could pride themselves very much, even upon New-street. After giving numerous examples in connection with this part of his subject, the lecturer said they did not want art so much to meet the demands of fashion and the desire to make good profits, as for its own sake, and because it was essential to their own life. They wanted the state of feeling which was active as well as passive. If they were to have national art, this was the first great requisite. People turned round and said that they could not do it if they had not the soil. Well, it was very unfortunate if they had not. But they had some comfort in this fact, that years ago—possibly some hundreds of years—art did flourish in this country. At that time there was no work any man did, however humble it might have been, but had some ornamental features about it. Mr. Chamberlain having referred to the influence of the Puritans, which was deadly in connection with art, whatever it was in other matters, concluded his lecture by observing that there was some comfort in the fact that there was a gradual increase of care for art in this country. With great drawbacks, they were perhaps getting on as well as they could reasonably expect.

HANLEY SCHOOL OF ART.

THE annual meeting of the Hanley School of Art was held on Monday evening, under the presidency of the mayor. The hon. sec. read the report of the committee, who were happy to have secured the services of Mr. Bradbury, the new master. They referred with great satisfaction to the result of the last national competition, which brought to this school one silver and two bronze medals, and the examiners, in their report to the Department, said they regarded with satisfaction the marked improvement in the studies forwarded from this school. The accounts had been made up to the end of last July, and included a year's income and sixteen months' expenditure. Mr. Bradbury, the master, read his report, which stated that the students had worked with great diligence, and made great progress. He regretted he could not carry out as he wished the drawing of flowers, plants, and foliage from nature, which was one of the most useful departments of study, but it was almost impossible to obtain suitable plants, either as gifts or loans, for the use of the students. The number of pupils during the year had been 174, the average monthly attendance of artisan students being 82. The modelling class was in a satisfactory state, and the private day class had succeeded beyond his expectations. The result of the national competition had been: Free studentships, 5; sets of works passed, 36; prizes, 16; second grade subjects passed, 36; prizes, 11. One silver and two bronze medals, and £10 offered as a special prize for a design of a vase or other large object, and open for competition to the students of the United Kingdom, had been awarded to this school. In a total of 117 schools, only 12 stood before Hanley in the number and quality of the medals obtained; while 41 schools had a larger attendance, and 59 were in towns with a larger population than Hanley. The statement of accounts showed that the balance against the school, which in September, 1870, stood at £43 6s. 6d., had increased to £90 17s. 3d.; and the expenditure for the period previously referred to amounted to £481 4s. 6d.

The directors of the North Union Railway Company have accepted the tender of Messrs. Banks, Thoruton, & Garside, contractors, of Bolton and Halifax, for the erection of the railway station, &c., at Preston, Lancashire. The works are to proceed at once and rapidly.

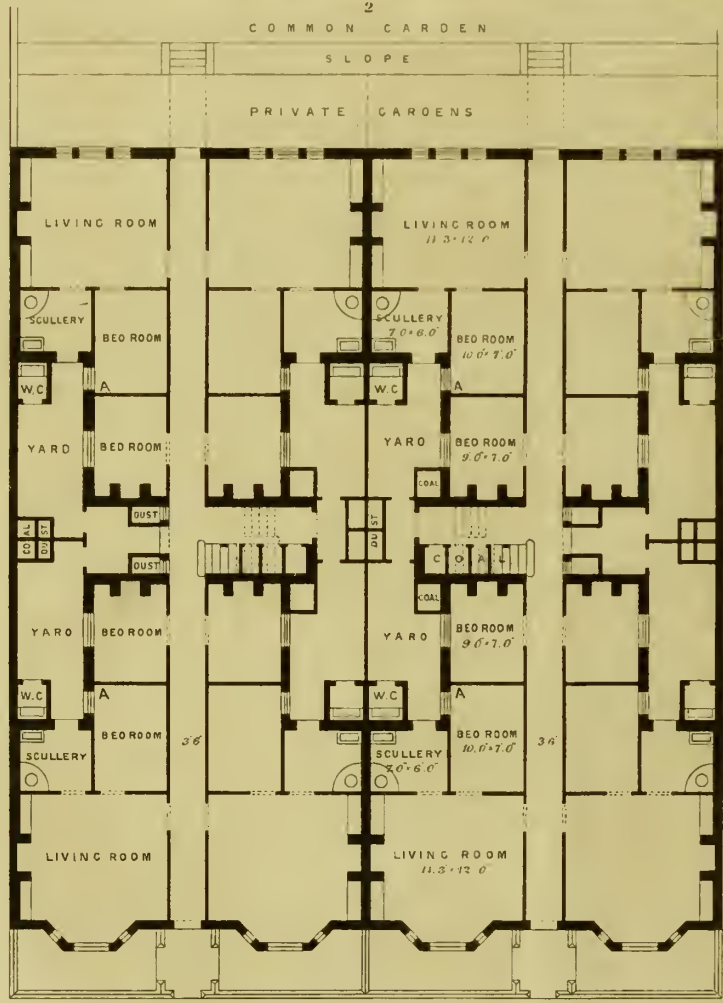
Mrs. Brooke, of Gateforth House, near Selby, has paid over one-half of a promised gift of £30,000 to the committee of the Royal Albert Asylum, Lancaster. The south wing of the asylum will henceforth be known as "The Brooke Wing," in acknowledgment thereof.

MR B. FLETCHER'S REGISTERED DESIGNS FOR
IMPROVED INDUSTRIAL DWELLINGS.

1.



2.



PLAN OF GROUND FLOOR.

Note. These houses may be constructed with a door communicating between the bed rooms close to window as shewn at A.

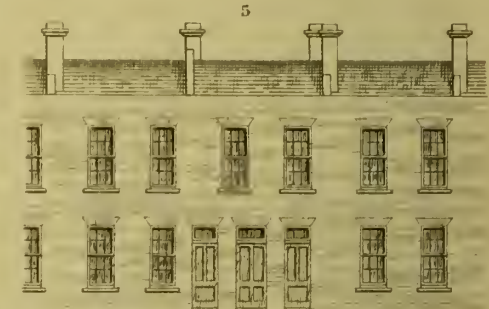
3.



PLAN OF ONE FLOOR.

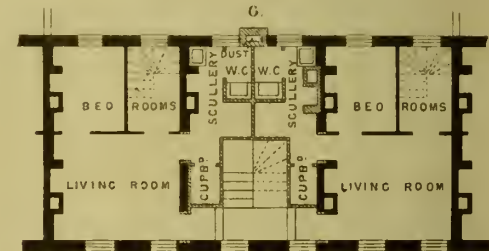
TWO ROOMED DWELLINGS.

5.



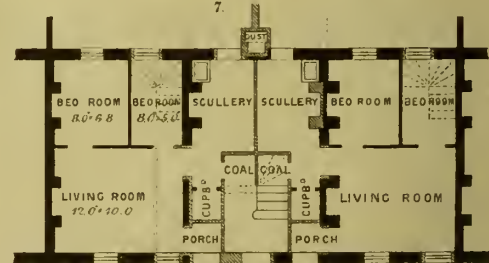
ELEVATION.

6.



PLAN OF FIRST FLOOR.

7.



PLAN OF GROUND FLOOR.

ALTERATIONS OF EXISTING DWELLINGS.
THE ALTERATIONS ARE SHOWN THUS

4.



ELEVATION.

10 5 0 10 20 30 FEET



TURKISH BATHS, JERMYN STREET.
ARTHUR CATES, ARCHT

THE ARCHITECTURAL ASSOCIATION'S EXHIBITION.

"Le Roi est mort; vive le Roi!" No sooner is the old Architectural Exhibition pronounced to be defunct than a new one rises in its place. Such, no doubt, was the impression left on the minds of many visitors who assembled in the newly-decorated galleries in Conduit-street, last Friday evening, as guests bidden to the Architectural Association's opening *soirée*. We are sorry to undecieve them, but the truth is that the exhibition closes this week, and indeed to have kept it open for any length of time would have been to ignore the result of many years' experience. The project of an architectural exhibition originated with the Association, and for awhile, aided perhaps, by the charm of novelty, it flourished under the management of that society. But as a self-relying and independent scheme it missed the fostering care of its first promoters, and gradually languished. The present temporary revival was half contemplated last season, but various causes led to its postponement until the occasion of the society's *conversazione*—as good a one, perhaps, as could have been selected to make it popular among the profession. Its popularity with the multitude is, we fear, past praying for. Whether it will be found worth while for the Association, at much trouble and some expense to renew their attempt from time to time may be doubtful; but meanwhile they may fairly be congratulated on the success of their experiment. The exhibition consists of two portions, the first embracing the annual display of prize drawings and sketches made in the classes of design, to which the smaller of the two galleries is appropriated, while the larger one is filled with contributions from without, in addition, of course, to the designs and drawings lent by members of the Association itself.

Among the latter works none deserve or attract greater attention than a series of swiftly-executed but admirable sketches by Mr. R. Phéné Spiers, illustrating the sad and now historical ruins of modern Paris. In the whole range of subjects which the Continent affords for pictorial study, these are, perhaps, the last which one would have thought an architect likely to transfer to paper; and yet we may safely add that there are none capable of awakening keener interest. Strange as it may sound, the very circumstances of the devastation which all Europe has been lamenting lends these ruins—even from an artist's point of view—a picturesque, if melancholy, charm. The "Salle des pas perdus" of the Tuileries, with its shattered vaults, its tottering walls, its stout girders twisted into shapeless masses of waste iron, and richly tinted, first by the action of fire, and afterwards by rust, could scarcely have been rendered more attractive, as a wreck, if centuries of decay had brought about what a few hours of wilful destruction accomplished. A vestibule in the same palace, with its vista of charred columns, battered doorways, and deserted staircases, yields in pictorial, still less in sentimental, interest to no relic of ancient Rome. The "Salle des Mareschaux," which retains sufficient traces of its chromatic decoration to suggest its former splendour, is another *triste*, though captivating subject. But perhaps the most touching of all is a view of the south façade from the Prefect's Garden, with its once fair arcade standing mutilated and blackened in the midst of overthrown masonry and broken columns, while a fountain which has escaped the general havoc still sends its water splashing over basins (so long neglected as to be filled with rank vegetation) down to the debris below.

If ever there were sermons in stone, these ruins have one to preach, and Mr. Spiers has done his best to render them impressive. Without striving after effect, without exaggeration of colour or scenic trickery, but by simply recording with an accurate hand and truthful brush all that could be recorded in

a sketch (and for such subjects we much prefer a sketch to the most finished painting), he has produced a series of studies which now and hereafter cannot fail to be historically interesting. The slight and facile nature of their execution renders them well adapted for reproduction by chromo-lithography, and we venture to suggest that Mr. Spiers might find it worth his while to adopt this means of giving them publicity.

Among the other pictorial works in the Exhibition are some drawings, chiefly executed in body-colour, by Mr. J. O'Connor, the smallest and best being a view of Amiens Cathedral, with a foreground of water, picturesque houses, and figures of peasantry. The broad unconventional handling of this sketch reminds one of Mr. Henry's manner, though it falls short of the refinement which that artist manages to unite with the vigour of his touch. Mr. O'Connor's "Interior at Caen" is an equally powerful and effective study, full of excellent qualities; but his large tempera painting, "View from the Triforium of Westminster Abbey," is on too grand a scale for the amount of finish bestowed on it, and consequently looks coarse in execution.

Mr. T. H. Longfield sends a series of elaborately-coloured geometrical elevations, apparently transferred from the Kensington Exhibition, and illustrating a restoration of Edward the Confessor's shrine. These drawings evince greater industry than artistic skill. The inlaid decoration has evidently been based on the remains of mosaic work which still exist on the monument, and appears tolerably correct in arrangement of pattern forms, if not always happy in association of colour. But we should be curious to know what authority Mr. Longfield has for his design of the gilt tabernacle which surmounts the shrine in his restoration. The wooden model now standing on the monument is, of course, a comparatively modern affair. At the same time, we cannot help suspecting that it bears—at least in general outline—more resemblance to the original feature than Mr. Longfield's ideal, which, whatever its intrinsic merits may be, seems out of keeping with the rest of the work.

Although the architectural designs exhibited do not, as a rule, rise above respectable mediocrity, there are some which, for certain reasons, deserve special mention. It would be obviously unfair to criticise Mr. E. W. Godwin's competition design for the Leicester Municipal Buildings by aid of the rough and unfinished, though clever, drawings which hang in Conduit-street. The absence of a plan necessarily prevents one from forming an adequate idea of Mr. Godwin's scheme as a whole. But in so far as one may judge from the principal elevation and a few sections, the artistic merit of the conception is well worthy of its author, which is in itself no light praise. A picturesque and well-proportioned massing of roof and wall—judicious distribution of window-space, scholar-like details, refined and well-studied tracery, constructive polychromy suggested rather emphasised, and a liberal use of decorative sculpture. Such are the characteristics which raise this designer's work far above the level of commonplace Gothic. Mr. Godwin, like all true artists, does not care, as the phrase goes, to repeat himself, and in this design we recognise a tendency to depart from the extreme severity of what we may venture to call his second style, which itself was perhaps the result of a reaction from the Ruskinism of his earliest efforts. The central clock tower, for example, is in its uppermost story of a more ornate fashion than Mr. Godwin has lately affected, and in some other details we find a concession to that order of taste which rests ill-satisfied with the cold dignity of proportions, however excellent they may be.

It is strange to turn from such work as this to the grandiose and academical drawing which Professor Kerr exhibits under the half-melancholy title of "An Old Competition De-

sign." In what year this design was prepared, or for what building it was intended, we cannot say with certainty, but judging from the fact that the Victoria-tower is introduced in the background, and that the principal façade appears open to a park, we may assume that it was submitted as one of the schemes for the structural amalgamation of public offices at Westminster. In style, we need scarcely say the design is severely Classic. Some idea of the building in point of size may be conveyed by the statement that the principal floor of one front is decorated with at least 140 Corinthian columns alternating with round arched windows the whole length of the building, and that the ground floor is occupied by a corresponding number of Doric pilasters. To modern critics this endless repetition of features may seem monotonous, but it must be remembered that there was a time when monotony with the Classic architect was an aim. How far that aim was justifiable we will not here discuss, but one fact is, we think, tolerably certain—viz., that under new conditions of taste we are likely to secure more variety of design than sufficed for the last generation. Even Professor Kerr has allowed his inventive faculties freer play since these drawings were completed, and there are hopes of his ultimate conversion to a brighter creed.

Mr. G. Vials sends a perspective view of Gwernafeld Church, North Wales, erected or rebuilt, we presume, from his design. Its principal features are a semi-octagonal Eend, and a sturdy square central tower, rising just high enough above the ridge nave roof to admit of two low lintelled belfry windows before it terminates in a slate spire. The same architect's "Design for the English Church at Patras" might, we think, with advantage, have shown either more decided affinity for its site or more emphatic relation to its purpose than the style selected seems to indicate.

The Exhibition, almost side by side, of the first and second prize designs for the "Criterion" restaurant, will enable the public to judge between their respective merits. For our part, we think Mr. R. P. Spiers has been more successful in his "Museum of Natural History," than in his conception of the Piccadilly building. Both show the influence of a modern French taste, but the former design is more refined in its details and more artistic in its proportions than the latter.

Admirers of Mr. Brooks's skill as a church architect must regret to find the really noble work of S. Chad's, Haggerstone, and S. Columba's, Kingsland-road, represented by the hotly-coloured and unsatisfactory drawings sent to Conduit-street. The same architect's "Town Hall and Corn Exchange at Wantage," a very clever though modest design, suffers, though in a less degree, under the artist's hands. The tinting of architectural drawings is occasionally carried to great perfection, but when a skilful brush is wanting it is surely far better to trust to a vigorous pen.

ARCHITECTURAL ASSOCIATION COMPETITION DRAWINGS.

THE special feature of this Exhibition is, of course, the collection of drawings sent in for the various prizes offered by the Association, or through its agency. For Sir William Tite's prize of £5 5s., the subject given for which was a design for an hospital for 100 beds, four sets of competitive drawings are shown. Out of these, that marked "Saint Luke" has been selected as the most meritorious for the main object the designer should have kept in view—namely, the convenience of plan and general management. The elevations, however, are deficient in many important respects, both with regard to construction and treatment architecturally. The amount of the prize offered was therefore divided between the author of this design (Mr. Keith D. Young, to whom £3 3s. was

given) and that of a far more pretentious and effective set contributed by Mr. W. Scott (to whom £2 2s. was awarded). The judges to whom the selection between these designs was entrusted were Messrs. Plumbé, Edis, Waterhouse, and Salter. In the plan of Mr. Young the two wings contain the wards for 48 males and females in each respectively, divided on two floors. The lavatories and closets are judiciously placed at the centre of the wards. Corridors, to which are attached small receiving wards, connect these wings with the central block of offices. The laundry is on a detached block at the rear of this, and a porter's lodge in the front of it. The whole is simply arranged, with good provision for light and air, and seems very practical. In the far more complicated plan of Mr. Scott, each wing is subdivided into two wards for twelve patients on each floor, with the lavatories, &c., at their ends, as at the Leeds Hospital, and made obtrusive features in a manner we do not approve. The elevation is of a heavy castellated character, with numerous towers, the purpose of which is not obvious; and the largest windows are grouped only for effect in parts of the corridors where they would be needless. Neither of the other sets were of merit at all approaching that of these premiated ones. The prizes offered by Mr. E. W. Godwin of £5 5s. and £1 1s., for the design of a house in such a street as Gower-street of 24ft. frontage, worked out in a given time at the rooms of the Association. For these there were eight competitors, and the judges were Messrs. J. H. Christian, E. W. Godwin, and Thos. H. Watson. The prize was awarded to Mr. H. A. Avern for a design in which the entrance-doorway, under a porch with arched opening, and a wide window, divided by wood mullions into three lights, occupied the ground floor, and two pairs of long Queen Anne proportioned windows the first and second floors; while a single dormer with two-light window therein gives light to the attic floor above, and an openwork parapet extends on either side of it to the party wall. By this arrangement it is obvious that the main central pier of the façade is not carried down through the ground floor, but comes over one side of the arched head of its wide window: this is not good construction. Although the design as thus shown for a single house of the street is quiet, and not without merit, we fear that if extended the length of Gower-street, it would not be much less monotonous than is the case at present. The second prize was awarded to Mr. T. E. Hudman. In his design the wide-arched doorway is sheltered only by a balcony to the window above it on the first floor. The fenestral arrangement at the side of it is of three distinct lights, with 14in. brick mullions or piers between a continuous stone lintel, and separate arched heads above, filled with herring-bone pattern in brickwork. The first floor has three separate windows, each under an arched head, similarly treated, and the glazed openings divided by a casement into two lights below them, and an oblong space above, with ornamental lead glazing. Three flat, obtusely-pointed openings occupy the second floor, and two dormers give light to the attics. These last, and the shape of the heads of its windows, as of those on the floor below, are objectionable. The balcony supports are heavy, and the repetition of the design would be as monotonous as the last, though the constructional arrangement of the solids and voids is better. Another design, marked with the motto "Streets of London," is not very dissimilar to the first described, but the four lights in the first and second floors are not grouped into pairs, but are equidistant, and an attempt to overcome the monotony has been made on the third floor, to which there are no dormers, but a range of narrow semi-circular headed openings and blank panels between, and a straight unparapeted cornice above, to which the district

surveyor would certainly object in Gower-street. This upper story is no improvement upon those in ordinary use. Perhaps the triplets of arched windows in the first floor of the design, "well considered," and its treatment of piers and openings, would be better than any yet mentioned, but other portions of the design are faulty. Upon the whole we must decide that the problem set by Mr. Godwin (a difficult one) has not been solved by any of these competitors, highly creditable though their attempts have been, and useful on the part of the projector and kind donor of the prizes. The Architectural Union Company's prize of £5 for the best series of measured drawings from existing buildings in England, or portions of the same erected previous to the eighteenth century, and the prize of £2 10s. by the Association for the second best series, were awarded to Mr. Phillip J. Marvin and Mr. F. W. Brooker respectively—to the former for a set of excellent drawings of the Church at Yaverland, and Quarr Abbey, in the Isle of Wight, and of Barking and East Ham Churches in Essex; some decorative details of the last-named church may be noted as an interesting example of the painted scrollwork then so freely used. Mr. Brooker's drawing represents the Tower, Choir, and Lady Chapel of S. Mary Overy, Southwark. In this case Messrs. Plumbé, W. White, T. H. Christian, and George Vials were the judges, and they have passed over with judgment the far more pretentious set of drawings from portions of S. Alban's Abbey, by another competitor, doubtless because the jointing of the stonework has evidently been put in, and the drawing lined up for effects, and cannot be trusted as drawn and plotted on the spot, and therefore truly represented.

Out of a large number of drawings and designs by the Class of Design of the Association, the first prize was awarded to Mr. S. J. Newman, for a series of sketches of considerable ability, among which we noted a rich octagonal chapter-house of good proportion and well-concentrated ornament, a porch for a wooden church, and a clever sketch for a stone bridge leading to the gates of a Mediæval town. The second prize was given to Mr. William Penstone, for a quaint design for a street mansion in the fashionable Queen Anne style, such as many souls love now to search out in Chelsea and elsewhere, but which, we think, may as well be left there as memorials of an age gone by, and not pure enough to bear reviving, although certainly they may be studied with advantage, and are preferable to many more pretentious modern works. A set of drawings by Mr. Aston Webb, of very great merit, received a special additional prize—the second prize, although he really merited it, was denied him this time, because of his having received it on a former occasion. His sketch for a columbarium, perhaps, looks too much like the adaptation of an old defensive town-wall tower. Those, however, of a village club and a stone bridge over a river are very charming and picturesque. In the elementary class of design, Mr. Philip James Marvin carried off the prize by two carefully-drawn large church windows of geometrical and leaf traceried character.

ARCHITECTURAL ASSOCIATION.

THE opening *conversazione* of this flourishing (and deservedly-flourishing) Association for session 1871-72 took place on Friday evening last. The members and their lady friends were present in strong force, and there was a large attendance of the senior members of the profession. In connection with this year's opening meeting a new feature has been introduced as an experiment; we refer to the exhibition of drawings, upon which we have commented on p. 331. If this is found to be a success, it will be continued annually, with, as the Committee of the Association hope, increased advantage and usefulness not only to the Association, but to the profession at large. The Association is heartily to be congratulated on the fruits of its

labours. And here we would say that its success is due, in no small degree, to the urbanity and courtesy invariably displayed by its officers, from the President downwards, in their demeanour towards both members and visitors. A well-merited and graceful tribute of this kind was paid by Mr. Rowland Plumbé, the new President, to his predecessor in office, Mr. T. H. Watson; and we feel sure, from our knowledge of Mr. Plumbé, that at the end of his term of office he will be deserving of a similar compliment. The same may be said of M. J. Douglass Mathews, the Vice-President; while those who attend the meetings of the Association regularly will not fail to recognise the assiduity to business and the courtesy of bearing exhibited by the Honorary Secretaries, Messrs. J. S. Quilter & Bowes A. Paice, and all the other officers. In fact, the great secret of the Association's success consists in the harmony with which its members, old and young, work and study together for mutual benefit. It is pleasing to see that so many of the old members of the Association, mindful of the benefits accruing to them from their connection with the Association when younger, devote a good share of their time in helping on the work of the Association by serving on committees and conducting the work of the various classes (or, rather, supervising it, for each class is self-governed). On the whole, the Association has well deserved its success, and we confidently expect that there will be no diminution in its usefulness during the session just inaugurated. We notice with pleasure that, like the "Post-office London Directory," the little "Brown Book" issued by the Association gets fatter and fatter every year, its increase in bulk being owing to the continued accession of additional information regarding the educational facilities afforded by the Association itself, and institutions, societies, &c., of a somewhat kindred nature.

Mr. ROWLAND PLUMBÉ, the President, took the chair at nine o'clock.

Mr. PAICE, Hon. Sec., announced that the following gentlemen had been proposed as members—viz., Messrs. R. S. Landell, H. Wipple, L. A. Shuffrey, W. Stair, W. Freeman, J. Brooks, F. Bargeman, G. E. S. Langford, A. S. Lawford, G. A. Barr, J. H. O'Brien, A. E. Page, A. Ingleton, J. Conder, V. Trubshawe, J. S. Eden, W. Wilson, and G. Bagshaw.

PRESENTATION OF PRIZES.

The various prizes offered by or through the Association during the last session were then presented as follows, the prizes consisting of books to the value stated:—

THE ESSAY.—A prize of two guineas and a half, given by the Association, for the best essay by a member on either of the following subjects—viz., (1) A monograph of William of Wykeham, or John Thorpe; (2) The influence of a cathedral church on the architecture of the neighbourhood; (3) On the structural and other differences between Modern and Mediæval Gothic architecture. Awarded by the judges (Messrs. Rowland Plumbé, G. H. Birch, & J. T. Perry) to Mr. W. R. Mallet, for his monograph of William of Wykeham.

CLASS OF DESIGN PRIZES.—A prize of two guineas and a half, given by the Association, for the best series of sketches contributed in the Class of Design during the past session; and a prize of one guinea and a half (also given by the Association) for the second best series. The first prize was awarded by the judges (Messrs. T. Roger Smith, E. W. Godwin, and Rowland Plumbé) to Mr. S. J. Newman. With regard to the second prize, the judges were of opinion that the series of sketches really meriting this distinction was by Mr. Webb, who was ineligible to take the prize, having taken the second prize in the same competition last year. Under the circumstances, therefore, the judges recommended that the second prize should be awarded to Mr. W. Penstone, and that the Committee of the Association should take into consideration the propriety of awarding a special prize to Mr. Webb.

ELEMENTARY CLASS OF DESIGN PRIZE.—A prize of one guinea and a half (given by the Association) for the best series of studies submitted by members of the class during the past session. Awarded by the judges (Messrs. T. Roger Smith, E. W. Godwin, and Rowland Plumbé), to Mr. P. J. Marvin. The judges also noticed as worthy of commendation some of the drawings submitted in this competition by Messrs. Hudman, Johnson, T. C. Yates, and McLachlan.

CLASS OF CONSTRUCTION PRIZE.—A prize of two guineas (given by the Association) for the best summary of subjects treated at the meetings of the class during the past session. Awarded by the judges (Messrs. J. Douglass Mathews, G. R. Redgrave, and L. C. Riddett) to Mr. Robert E. Pownall.

SIR W. TITE'S PRIZE.—A prize of five guineas, given by Sir William Tite for the best design (by a member of the Association) for a hospital for 100 beds. The report of the judges (Messrs. Waterhouse, Edis, Plümbe, and Salter) was read by Mr. Salter. It stated that in this competition five sets of drawings had been submitted. The judges had carefully examined each set, but hardly considered any one set so decidedly superior to the others as to be entitled to the prize. The design marked with two red circles had defects in planning; the various offices being wrongly disposed; but this design had well-executed elevations, and some good points in its plan. The design marked "S. Luke" was most carefully considered, and the arrangement was very compact. The administrative buildings were very well designed, but the elevations were inferior in design to those on the set of drawings marked with two red circles. The judges said that as there could be no doubt whatever that in a building of this kind the arrangement of the plan should receive the first consideration, they recommended to Sir W. Tite and the Architectural Association that the prize should be divided between the two designs named, in the proportion of three guineas to "S. Luke," and two guineas to the design marked with two red circles. The authors of these designs were found to be Mr. Keith D. Young and Mr. William Scott respectively.

PRIZES FOR MEASURED DRAWINGS FROM EXISTING BUILDINGS.—A prize of £5 (given by the Architectural Union Company) for the best series of measured drawings from existing buildings in England erected previous to the eighteenth century, and a prize of £2 10s. (given by the Association) for the second best series. Both prizes open to all members of the Association. Awarded by the judges as follows: First prize, Mr. P. J. Marvin; second prize, Mr. J. W. Brooker.

MR. E. W. GODWIN'S PRIZE.—A prize of two guineas, given by Mr. E. W. Godwin, for the best design, by a member of the Association, for a London street house, to be worked out under special circumstances. Awarded by the judges to Mr. H. Avern. It was stated, in the absence of Mr. Godwin, that that gentleman was so well pleased with the result of this competition that he intended offering a similar prize this session.

We may state that all the designs, &c., sent in competition for these prizes were under mottoes, and the names of the successful competitors only known to the members when the reports of the judges were read. As the chairman presented the prizes he addressed a few words of congratulation to each recipient.

THE PRESIDENT'S ADDRESS.

MR. ROWLAND PLUMBE, F.R.I.B.A., the President, then gave a short address on the position and prospects of the Association. He said that for yet another year the Association had prospered, the number of students joining it comparing favourably with the number who had joined in past years. The attendance at the ordinary meetings had been satisfactory, great interest had been shown in the subject-matter of the various papers and essays that had been read, and many interesting discussions had resulted. The work undertaken by the several classes had been well carried out, and much useful instruction and knowledge had been imparted through their means. The Saturday afternoon visits had not failed in bringing together large numbers of the members desirous of this opportunity of studying the construction and architectural features of the buildings visited. The excursion so kindly organised and assisted by Mr. Edmund Slarpe had been thoroughly appreciated by those who were so fortunate as to be able to attend. Great advantage had been taken of the lending library of architectural books, and the various other agencies of the Association had been thoroughly successful. Financially there was no reason for anxiety, a large balance remaining in the hands of the Treasurer available for the carrying out of the operations of the present session. The Association had great reason to congratulate itself on the choice made of its President for the past session (Mr. T. H. Watson); and wherever—as must necessarily be the case—differences of opinion and difficulties of management had arisen, the officers had always been able, under his skilful management, to support him unanimously in the carrying out of such measures as were necessary for the well-being of the society. Having paid this well-deserved tribute to the past-President, Mr. Plümbe continued:—One of the most pleasing duties that a new President has to perform is probably that of presenting the rewards given to the successful competitors for the various prizes offered by the Association during the year that has passed. In the present instance the invitation given to com-

pete has resulted in so hearty a response that we cannot but regard this last action of the past session as most fittingly closing its career. An inspection of the various competition drawings submitted and exhibited in the galleries this evening will show that a decided improvement has taken place in this branch of the society's efforts. And when the comparatively insignificant value of the prizes given is compared with the great amount of work done, it must be admitted that the reward of success is held to be much more in the honour and knowledge gained than in the substantial benefit conferred. The prosperity and success of the past session, though a matter of congratulation, is yet a cause of anxiety to those who are responsible for the well-being of that now commencing. Greater exertions must be made to prevent a diminution of interest, and, if possible, to surpass the last session in the success attending it. This will be the constant aim of the present management. It is gratifying to know that on the outset our prospects are promising. We begin by establishing a new exhibition of architectural drawings which, for the first time, we hang on the walls of these galleries as the commencement of a new effort on the part of the Association to provide an additional means of instruction to its members, and which, it is trusted, will in time grow the more valuable as its object becomes better known to the elder members of the profession, who are asked to co-operate in it. Among the many drawings of interest exhibited, I must particularly call your attention to the series representing the ruins of Paris, the production of one of our past Presidents, Mr. R. Phené Spiers. (Applause.) The work of the classes will, it is hoped, be continued with increased vigour. The syllabus of papers to be read at the ordinary meetings is in no way inferior to that of last session. The library will be increased, as also the number and value of the prizes to be given, while all the other operations of the society will, it is anticipated, be carried on with spirit and success. Among the many topics of interest which have arisen during the past session there is one which I feel compelled particularly to mention. It is thought by some of the elder members of the profession, and it has been specially advocated by the President of the Royal Institute of British Architects, that it would be well if the Architectural Association and other kindred societies could be united with the Institute, so that the whole could be worked as one powerful body. The Architectural Association (at all events, in late years) has been most anxious to co-operate in all those projects of the Institute that in any way approximate to those which it has itself in view, and which have related mainly to the education of students and younger members of the profession, and possibly in years to come a much more intimate connection between the two societies may exist. But we feel convinced that the Association, constituted as it is at present, can do its own work in its own way, and do it much better than would be the case were it merged into any general and larger society, and in this opinion we feel that we are supported almost unanimously by the members and well-wishers of the Association. (Applause.) In the many efforts that are being made to bring architectural education to a system and to create a standard of efficiency and learning to which all members of our art must be brought, there is just the fear of reducing the profession to one dead level of thought and practice; and though this might be in many ways superior to the system at present existing, we should yet regard it as being in some respects unfortunate. We believe it is quite probable that in the attempt to create one general school of architecture in England, one in which all its members would be educated to regard only as correct those principles and tenets which its professors for the time being might hold, great injury might possibly be done to our art. It is just as easy to destroy the genius and the talent which a great Creator has implanted in a man by too-close an adherence to systems of education, and by too-rigid a training in the doctrines of a special school, as to fit for the practice of our profession by careful training the minds of those possessing no such talents or special qualifications for it. And we venture to think that the harm done to our art by the extinction of, or injury to, one mind God-endowed for its special work can never be remedied by the creation of a whole school of professional mediocrity. (Applause.) Now in our mutual efforts to help each other and to place facilities in the way of our members for gaining a complete knowledge of the work that has to be done by us, we would above all things guard against this loss of individuality. We would teach the young architect first by a careful and diligent study of the works of the old master-builders how to train his hand and eye to fit him to appreciate all that is true and beautiful in art itself, and we would dis-

courage in every young architect the tendency that exists to fall back upon and to be satisfied with that which is being done in the present day, even though the work be good and the authorship that of a master-mind in the profession. How often would beginners see the mistake they make in thus learning could they better know the mind of the author of the work they so much admire, and which they hope, by a comparatively easy road, to equal and imitate. Could they but see the disappointment which has been occasioned by the inability to carry out the lofty conceptions which the author has struggled to realise, the regret that constantly follows the true worker in knowing that he can never reach the absolutely true and beautiful, that he can never call his work finished and perfect, but that his true work in art-life will ever be to maintain a constant struggle and hard fight to reach a goal of perfection which in itself is hardly less an attribute of the Deity, he would be much less ready to accept the work of any living architect as his ideal model. But while we seek to develop the artistic elements of our art, we would not do so to the exclusion of those qualifications which are equally necessary for the successful practice of our profession. We endeavour to make men of business of our members, and to teach them how to acquire that knowledge of the practical part of the art that is so necessary in this material and commonplace age. The successful architect in the present day should be one who can protect his client's pocket as well as give him good architecture. He should know practically how to build to the best advantage, as well as how to design the most perfectly. He should also be able to conduct the various duties pertaining to his calling in a common-sense, conscientious, and business-like way. We would further teach our members, and we would also desire to impress upon our clients and the public generally, that if this knowledge is gained and acted upon, the best architecture is in every way the most economical. True art is not in itself an expensive thing. We now collect and treasure the works of bygone years—their paintings, their porcelain, their enamels, their works in metal, stone, ivory, and pottery, and are willing to purchase them at fabulous prices, and to treasure and hoard them in our cabinets and museums as articles of priceless value. But in the days in which they were made, they were frequently articles of the ordinary and common usage of everyday life, not costly or hard to be got, but used by the poorest members of the community. And our appreciation of them frequently arises from perceiving their beauty and fitness for the common purposes for which they were used, and from our inability, in this age of badly-educated art-workmen, to produce their equals. Now we would seek to encourage each other to study and practise our profession in the spirit of the old art-workers. We would discourage all waste, extravagance, and unfitness in the use of all material and workmanship in our buildings, discarding everything that is not necessary for their construction and composition. Above all, we would discourage the vulgar and common fault of covering our buildings with useless and costly ornamentation, which can never succeed in making a bad building good (though to some extent it may for a time gain it a cheap and fleeting popularity), and which is certainly sure to spoil the effect and mar the proportions of any good building in which it may be used. Above all, we would insist upon a thorough and careful study of the innumerable improvements in materials and manufactures which the present age affords, and the command of which should give us so great an advantage over those who have gone before, and we would try in every way to design so as to ensure their true adaptation to the uses we put them to in our buildings. All forms of faulty and deceptive construction we would avoid, seeking ever to let the requirements of our buildings and the materials with which we build tell their own tale well and truly, without undue regard to the supposed requirements of any school or system of architecture which has previously existed. In short, we would try in every way to carry out the great and good principles involved in the teaching of the motto which we have adopted to characterise our Association—viz., to "design with beauty" and "build in truth." I am glad to see there are so many old friends and former workers of the Association now present. We do not seek to take up your time this evening by any long discussion, but we have usually had the advantage of just a word or two of counsel from some of our visitors. Perhaps I cannot do better than first of all to call upon Mr. Chatfield Clarke, an old friend of the Association, and a member of the London School Board, for a few remarks. (Applause.)

MR. T. CHATFIELD CLARKE, F.R.I.B.A., said he had very little to say except to compliment his old

friend Mr. Plumbé on seeing him the occupant of his present dignified position as President of the Association, and to congratulate the Association upon the very useful work it was doing. The Association was doing the very work which was most required in the profession. It had long been acknowledged that as a general rule the education of young architects was very deficient, and by its efforts the Association was doing very much to remove such a reproach to the profession. He wished the Association every success, and should be glad at all times to assist in any and every way he possibly could. (Applause.)

Professor KERR had very little to say, except to second what Mr. Chatfield Clarke had said. He was glad to see another session of the Association's labours inaugurated under such favourable auspices. The work which the Association had done in past sessions had now come to be abundantly acknowledged on all hands, and the work which it had yet to do would be equally well done, and would receive an equally full acknowledgement. He would say no more, on account of the excessive heat of the room, which was not at all creditable in an "architectural" building. (Laughter.)

Mr. R. W. EMIS, F.R.I.B.A., F.S.A., said that as a past President of the Association he was both proud and happy to see how much the Association was doing to benefit the profession. He hoped it would continue to go forward to the task which it had set itself with that modesty and discretion which had ever characterised it, for that was the only way in which, as an association of the junior members of the profession, it could do good. If its members tried to do more, and strove to become, in matters foreign to the objects of the Association, rivals of those who had gone before, it would cease to retain the respect of the elders of the profession. (Applause.)

Mr. W. WHITE, F.R.I.B.A., F.S.A., also a past President of the Association, said his observations would be devoted to a practical purpose, viz., the subject of the prizes offered by the Architectural Union Company for the best series of measured drawings of old buildings, upon which he was appointed one of the judges. He was of opinion that the present competition, as a whole, showed a marked advance upon that of last year, although he did not think there was one subject so well worked out as that of S. Leonard's at Stone in the previous competition. But although so much ability had been evinced in this competition, he thought that it would be a great advantage in future if the sketches from which the finished drawings had been made were exhibited with the finished drawings themselves, as in the absence of the sketches it was very difficult to judge in what manner the drawings had been worked up. If his suggestion was adopted, he should be glad to supplement the prizes offered in the competition with a two guinea prize for the best set of sketches exhibited, irrespective altogether of the merits of the finished drawings made from such sketches. (Applause.)

Mr. T. ROGER SMITH, F.R.I.B.A., another past President of the Association, said he should follow Mr. White's example, and confine his remarks to some of the results of the working of the Association as exemplified by the drawings on the wall. With regard to the drawings made by the members of the Class of Design, he would just point out, to those who might not have noticed it, that they were exactly the sort of drawings which they ought to be able to make to show to their clients before undertaking the commencement of any important public building. A facility for making such drawings did not come by nature; it could only be gained by hard and steady application. The practice, again, of the Elementary Class of Design was of a character which he was sure would be found useful to the members during the whole course of their professional career. In the adjudication of the prizes they had the assistance of the most trenchant, candid, and sagacious architectural critic that he knew—viz., Mr. E. W. Godwin, and that gentleman had been exceedingly pleased by the nature of the drawings exhibited in the Class. With regard to the general prosperity and enlarged usefulness of the Association's operations, Mr. Roger Smith said that it seemed to him, when he looked round the room that evening, that there must be some mistake. He could remember attending a meeting of the committee some years ago, when it was seriously discussed whether the Association should not be given up altogether as a failure. It was decided to try it for another session, and it had since gone on increasing in prosperity and usefulness year by year. He was sure that the gentleman who, at the meeting referred to, proposed and succeeded in carrying the resolution for continuing the existence of the Association, must be exceedingly gratified by what he saw on the present occasion. (Hear, hear.)

This ended the speech-making. Coote and Tinney's band contributed to the enjoyment of the evening by a very ably-rendered and well-selected programme of music. The refreshments were supplied and served by Mr. Ruthven, cook and confectioner, and the Association is to be congratulated on its very marked advance in this respect.

The next meeting of the Association will take place this (Friday) evening, when there will be an address from the President, entering further into matters of interest to the Association and the profession than was possible in the foregoing short address; and the reports from the various classes will also be received.

THE INSTITUTION OF CIVIL ENGINEERS.

THE meetings of this society, which was founded in 1818, and was incorporated by royal charter in 1828, for the general advancement of mechanical science, will be resumed on the second Tuesday in November, the 14th inst., and will be held weekly till the end of May, with the exception of the last Tuesday in December and the first Tuesday in January, and the Tuesdays in Easter and Whitsun weeks. The annual general meeting for the election of the President, four Vice-Presidents, and fifteen other Members of Council for the ensuing year, will be held on Tuesday, the 19th December. At this meeting the outgoing Council will present a report on the condition of the Institution, and will lay before the members a statement of the receipts and payments for the year ending on the 30th of November, as well as of the funds belonging to, or under the charge of, the society at the same date. The list of members of this society now contains the names of 14 Honorary Members, 725 Members, 1,056 Associates, and 205 Students, making a total of 2,000 of all classes. At the same date last year these figures were 16, 699, 994 and 176, together 1,885 respectively. During the last three months, the deaths have been recorded of F. M. Sir John Burgoyne, G.C.B., &c., Honorary Member; of Messrs. Joseph Hamilton Beattie, John George Blackburne, Robert Benson Dockray, Albinus Martin, and Josiah Parkes, Members; and Messrs. Arthur Field, Edward Mosley Perkins, and Henry Beadon Rotton, Associates. In the period referred to no additions have been made to the list, as the meetings have been suspended during the vacation.

DEATH OF MR. J. EASTON, THE ENGINEER.

THE death of Mr. James Easton, the founder, and for nearly forty years the senior partner, of the well-known firm of engineers which still bears his name, took place last week. He was born in 1796, at Bradford, near Taunton, and was a son of Josiah Easton, a well-known and much-respected land agent and surveyor. From a very early age he practised surveying and civil engineering, in conjunction with his father. He came up to London in 1822 to introduce the hydraulic ram, the patent of which he had purchased from the celebrated Montgolfier. In 1825 he was engaged in conjunction with the late N. G. Rennie in a survey of the then projected London and Northern Railway, to which George Stephenson was consulting engineer, and he made the Parliamentary plans for the section from London to Peterborough through Cambridge. The scheme, which was most influentially supported by the leading monetary and mercantile men of the day, was carried to Parliament in 1826, but the money panic of that year put a stop to this, as well as many other projected railway undertakings. Mr. Easton then turned his attention to mechanical engineering, and in 1827 established himself at the Grove, Southwark, where the business is still carried on by the present well-known firm. Among a vast number of works he carried out during his long career may be briefly mentioned the perfecting and extensive introduction of the hydraulic ram, the supplying with water of above 30 towns, the Government waterworks at Trafalgar-square, which supply the palaces and public offices besides the Houses of Parliament, the improvement of the navigation of the Dartford and Crayford Creeks, and the drainage of the whole of the marshes from London to Dartford on the right bank of the Thames. In 1866 Mr. Easton retired from the firm he had founded, but his active nature and love for his profession made him continue to take a great interest in many of the undertakings he had been instrumental in inaugurating, and up to the day of his death he retained the post of engineer in charge of the Government waterworks and ornamental waters in the parks, to which he had been appointed by the Chief Commissioner of Her Majesty's Works. In Mr. Easton the country has lost one of the pioneers of engineering—one of that

band of men who had to devise and inaugurate works with little or no experience to guide them, and prepare the way of the more brilliant but not more solid achievements of modern engineers.

ASSOCIATION OF MEDICAL OFFICERS OF HEALTH.

THE first meeting of this association for session 1871-72 was held last week at the usual place of meeting, the Scottish Corporation Hall, Cranecourt, Fleet-street, Dr. Druitt, M.D., President, in the chair. After the usual preliminary business had been disposed of, and a number of new members enrolled, Mr. Gardner Brown exhibited a new self-acting disinfecter for water-closets, lately invented by him and patented. Sympathy was expressed at the death of Dr. Beale, medical officer for S. Martin-in-the-Fields, and for the dangerous illness of Dr. Puckle, medical officer for Lambeth—his illness having been contracted in the discharge of his official duties. Dr. Liddle then read a paper on the connection between impure air and unhealthy dwellings and diseases and sickness among the poor. He quoted many eminent authorities in proof of his assertion that consumption, debility, atrophy, scrofula, and other diseases were brought on by the breathing of impure air. To show how the same class of people suffer from ill-health in their wretched homes, he adduced the high state of health prevailing in prisons compared with that of the surrounding population. He likewise gave statistics proving how a number of pauper boys received on board the training ship "Goliath" had increased in height, weight, and breadth of chest, to a wonderful extent. Dr. Liddle exhorted the members to press their respective boards to put in operation the existing laws for amending the sanitary condition of the dwellings of the poor. In respect of the erection of new houses, he considered the law not sufficiently stringent, and he suggested that the Association should use its influence in procuring the insertion of effective sanitary clauses in the new Building Act, which would probably be brought in again in the approaching session. A discussion followed, in which the President, Drs. Stevenson, Hiff, Hurdwicke, and Sutton, the Rev. Mr. Cohen, and Messrs. Gladden and Finlay, took part. All lamented the unsatisfactory condition of the dwellings of the working classes, but opinions varied as to what was necessary to be done. One difficulty arose from the ignorance of the poor, another from the greed of landlords, another from the fact that members of vestries were, in many cases, connected with these unhealthy houses. All agreed that at least the building of any more tenements of this unsatisfactory kind should be prevented by legislative enactment in the interest of the health of the poor and the pockets of the ratepayers, upon whom they fell as a burden in case of sickness.

GRANITE AND ASPHALTE PAVEMENTS.

THE following is the substance of the report to the Streets Committee of the Hon. the Commissioners of Sewers of the City of London upon Granite and Asphalt Pavements, by William Hlaywood, Engineer and Surveyor to the Commission:—

GENTLEMEN,—The reference to me upon this subject is conveyed in the following resolution of the Streets Committee:—"That it be referred to the Engineer to report generally upon the asphaltes which have been laid or are to be laid in the carriage-ways of the City of London, and upon their advantages and cost as compared with stone pavements. Also as to the streets, which, in his opinion, are, from their gradients or any other cause, unfitted for such asphalt pavements." In accordance with those instructions I now beg to present you my report, and the reference being to carriage-way pavements the report deals almost exclusively with them.

ASPHALTE CARRIAGE-WAY PAVEMENTS.

The asphaltes which have been, or about to be, laid down in the carriage-ways of the City of London are—The Val de Travers Compressed Asphalt,* the Val de Travers Liquid Asphalt,* the Limmer Liquid Asphalt,* Barnett's Liquid Iron Asphalt, McDonnell's Patent Adamantane Concrete Paving; and to these may be added granite sets with asphalt joints.

VAL DE TRAVERS COMPRESSED ASPHALTE.

This is composed of a mineral from the Val de Travers, a few miles from the town of Neuchâtel, in Switzerland.

* The term "liquid" asphalt is used to indicate those asphaltes which are brought to a semi-liquid state by heat, before being laid. French writers have named these "mastic" asphaltes.—W. H.

It is laid in the following manner:—A foundation is formed of cement or lime concrete, varying from six inches to nine inches in thickness, according to the traffic in the street. The mineral rock in its natural state, and without admixture with other ingredients, after being broken into small lumps, is then brought to a state of dry powder by subjecting it to considerable heat in revolving ovens; it is then put into iron carts with close-fitting covers, and brought on to the works, taken out, laid over the surface, and whilst hot compressed with heated irons into one homogeneous mass without joints.

The finished thickness varies from 2 to 2½ inches, according to the traffic of the street in which it is laid, and it further compresses and consolidates under the traffic; the company states that this compression is from 20 to 25 per cent.

It is called compressed asphalt on account of the mode of laying it, and this definition should be held in mind, as it expresses a special characteristic of the Val de Travers asphalt, which, as far as I know, is possessed by no other, and which is, perhaps, the reason of its success, and why it alone has been laid to any great extent in the carriage-ways at Paris.

The first street laid in Paris with this material was the Rue Bergère in 1854, and it has since been extensively laid in that quarter of the city which lies between the Boulevards, from the Church of the Madeleine, to the Rue Poissonnière and Rue de Rivoli. There were before the war many miles of it at Paris, and some of it in streets of considerable traffic, among which may be mentioned the Rue de Richelieu, which has a traffic at seasons of the year of about 5,000 vehicles daily; and the Rue Neuve-des-Petits Champs, paved in 1860, which has also a large and mixed traffic.

The company, at its own expense, with the view of satisfying the Commission of the fitness of their compressed asphalt for carriage-ways in streets of much traffic, laid 485 square yards in Threadneedle-street, near to Finch-lane, in May, 1869. At the same time they laid 147 yards of liquid asphalt in the footways immediately adjacent to that laid in the carriage-way, and also at their own expense.

The compressed asphalt in Threadneedle-street was laid upon a foundation of cement concrete eight inches thick, on the top of which a coating of mastic, half an inch in thickness, was run and worked to the proper gradients and curvatures and upon the mastic the asphalt, two inches thick, was placed. It was heated in this instance upon the works, and was taken direct from the ovens and put into its place.

The weather being exceedingly wet when the concrete was laid, and indeed during the whole time the work was in hand, the pavement did not progress so quickly as I desired, and the mastic was laid to expedite the work; but it has not been employed in any of the compressed asphalt pavements since laid in the city. The daily traffic at this spot is about 4,200 vehicles in twenty-four hours.

The next pavement formed with it was that in Cheapside and the Poultry, which was completed in October, 1870. It was laid in the manner already described, with the omission of the mastic. The thickness of the foundation is 9in., and the asphalt 2½in.; but the asphalt was in this case brought to the work already heated in iron carts, so as to prevent offence to the public from the smell caused by heating it on the ground; and this mode has been adopted by the company in all the pavements laid since that time. There is, however, still and unavoidably a slight bituminous smell when it is being laid.

The price paid for the concrete was 1s. 9d., and for the asphalt 16s. 3d., making together 18s. per square yard complete.

The numbers of vehicles which pass over these pavements daily in twenty-four hours are—in Cheapside, west of Queen-street, about 11,900; in the Poultry, about 9,600.

The following carriage-way pavements have also been laid with compressed asphalt:—Old and New Broad-streets, Queen-street, from Cheapside to Queen Victoria-street, part of the Old Bailey, Gracechurch-street, part of Milk-street, Russia-row, part of Throgmorton-street.

Other carriage-ways ordered to be paved with it are:—Wood-street, from Gresham-street to London-wall, Finsbury-pavement, part of Moorgate-street, London-wall, from Moorgate-street to Broad-street.

The total area already laid is about 16,000 square yards, and of that yet to be laid about 9,000 square yards.

The company is to keep all the pavements in repair for seventeen years from the date of completion, the first two years without charge, and the remaining fifteen years at a price per square yard per annum over the whole surface, which price has been agreed upon,—and the company is to leave them at the expiration of the seventeen years in as good a condition as when new.

The company states that at the expiration of the seventeen years it will continue to maintain the pavements at the respective prices per square yard per annum for a further term of years, but it has made no tender to that effect to the Commission.

The Commission may terminate the arrangement as to repairs at the end of the first seven years, and may afterwards direct such repairs only as it thinks needful from time to time, paying for them at a price per square yard which has been arranged.*

Restorations over openings made for gas, water, or sewerage purposes, are to be paid for at 5s. 9d. per square yard, including the making good the foundation.

VAL DE TRAVERS LIQUID ASPHALTE.

In March of the present year the company formed the carriage-way pavement of George-yard, Lombard-street, with their liquid asphalt, which is laid upon a concrete bed 6in. thick, the asphalt surface being 1½in. thick. Its superficial area is 232 yards.

In laying this pavement, the rock is first ground to a fine powder, and being then placed in caldrons on the works, from 5 to 7 per cent. of bitumen is added to solve it; heat being then applied, it forms into a semi-fluid or mastic state, and when in that condition, about 60 per cent. of grit or dry shingle is added to it, and after being thoroughly mixed together, the compound is spread over the concrete in one thickness.

The price with the concrete is 12s. per square yard, and the company undertakes to maintain it for ten years without any cost to the Commission whatever.

The price for repairing over openings for gas, water, or sewerage purposes is to be 5s. 9d. per square yard.

The footways of part of Gracechurch-street have also been laid with liquid asphalt by this company.

LIMMER ASPHALTE.

The Limmer Asphalt comes from a mine situated at Limmer, near the City of Hanover, and another situated at Vorwohle, near Alfeld, in Brunswick.

It is laid in the following manner: a concrete foundation is first formed, and the asphalt, which in the Hanoverian mine differs in quality from that in the Brunswick mine (the one being harder than the other), is used in certain proportions by the judgment of those directing the work; it is broken up and mixed with clean grit or sand of different sizes according to the place in which the pavement is to be laid; a small quantity of bitumen is then added to the materials, which are placed in caldrons on the spot, made liquid by heat, and the compound is run over the surface and smoothed with irons to the proper slopes and curvatures.

It is run in two thicknesses, the lower stratum being made with grit of a larger size than that of the upper. The total thickness of the asphalt, when finished, is from 1½ to 2 inches, according to the traffic in the street.

The only carriage-way in this city laid with it is that of Lombard-street, which was finished on the 18th May last. The concrete in that street is 9 inches, and the asphalt 2 inches thick; the area is 1653 yards.

The price of the concrete is 2s. 8d., and the asphalt 13s. 4d., making together 16s. per square yard; the conditions as to maintenance and repairs are similar to those arranged with the Val de Travers Asphalt Company for Cheapside and other thoroughfares, and the price for maintenance after the first two years is to be 9d. per square yard per annum over the entire surface.

The traffic which passes over Lombard-street daily in twenty-four hours is about 2,600 vehicles, mostly consisting of cabs or light traffic, excepting at a small portion of the western end, where a few omnibuses pass on to and stand upon it.

The other specimen of this asphalt which has come under my observation is in Bermondsey-street, opposite the old church, where 329 yards were laid in the carriage-way in October last. It is formed upon a bed of concrete, 9 inches thick; the thickness of the asphalt is 2 inches; the traffic which passes over it daily during twenty-four hours is about 2,000 vehicles, of a mixed character.

It has been laid at Glasgow, in the carriage-way of Vincent-lane. The surveyor of that city informs me that about 140 carriages pass daily over it, and that it is a private thoroughfare.

The company states in its prospectus that the asphalt has been successfully tried at other places, and in some of the large cities of the Continent, including St. Petersburg, Berlin, Hanover, Warsaw, and others, but it does not state whether in the carriage-ways or footways of those cities, and, in answer to my inquiries upon this point, I have been

informed of the carriage-way of the Ernest August Bridge, at Hanover, where it has been laid five years.

It is intended to pave part of Moorgate-street with this asphalt, so as to test it by the side of others.

BARNETT'S LIQUID IRON ASPHALTE.

This can be made either of natural or artificial asphalt, mixed with pulverised iron ore or sesquioxide of iron and a small proportion of mineral tar; it may also, under the patent, be composed of other ingredients, but Mr. Barnett states that that which is intended to be used here is similar to that just described.

The materials are put into a cauldron which is brought on to the works, and are made into a liquid state by heat, run over the surface, and smoothed in the same way as the other liquid asphalts mentioned; the thickness usually laid is about two inches.

About 1,000 yards of it are to be laid in Moorgate-street as an experiment, adjoining specimens of the Limmer liquid, and the Val de Travers compressed asphalts.

The price, with the foundation, is to be 13s. 6d. per square yard, 4s. 6d. to be paid at the expiration of the first year, another 4s. 6d. at the end of the second year, and the remaining 4s. 6d. at the end of the third year, provided that the pavement at the end of each financial year is in a good condition. Mr. Barnett's responsibilities are to cease at the end of the third year.

Mr. Barnett states, however, that he will undertake to maintain the pavement for about fifteen years, at 1s. 4½d. per square yard per annum, measured over the whole surface.

Repairs over openings for gas, water, and other purposes, are to be 5s. 9d. per square yard, including the concrete.

Three specimens of this asphalt have been laid in carriage-ways at Paris, one in the Rue vide Goussét in 1867, one in the Guichet de Carrousel about two years ago, and one in the Rue Vaugirard, near to the Luxembourg Palace, laid about 18 months ago.

I have inspected those in the Rue vide Goussét and the gateway of the Carrousel. The traffic over the former is not inconsiderable for Paris, and that in the gateway of the Carrousel was large, before the war broke out; what it has since been I cannot say.

M'DONNELL'S PATENT ADAMANTINE CONCRETE PAVEMENT.

In April, 1869, about 757 square yards of the carriage-way of Carter-lane were paved with this material, which is composed of blocks made with broken stone, chalk, lime, and clay, mixed with vegetable or mineral pitch or tar.

The blocks are 18 inches long, 12 inches wide, and 6 inches deep, and were laid ¾ of an inch apart from each other, upon a solid foundation, and the joints were then run with an asphaltic composition.

The price per square yard is 20s., seventy-five per cent. to be paid within two months after the completion of the work, ten per cent. at the expiration of two years, and fifteen per cent. at the expiration of three years, provided the pavement is at each period in a good state of repair; at the end of the third year the contractor's responsibility ceases.

The traffic over it was until recently about 700 carriages daily in 12 hours; it is now less, owing to Queen Victoria-street, west of Bennett's Hill, having been opened.

GRANITE PAVEMENTS WITH ASPHALTE JOINTS.

The ordinary mode of forming granite pavements in the metropolis is to fill up the joints with lime grout, which prevents the surface water from sinking between them into the foundation, and makes the pavement compact and solid.

Pavements jointed with asphalt having been used at Manchester, and other northern and midland towns, the Commission determined to try it in the city, and an experiment was accordingly made in Duke-street, Smithfield, in May, 1868.

In that street 350 yards of pavement were formed of granite from Carnarvon, the size of the stones being about 6 inches by 3 inches, and 6 inches deep; they were laid one inch apart from each other, the joints were filled up with small clean pebbles, and a composition of pitch and oil in a heated state was then run into them. This mode of forming pavements being well understood at Manchester, the incorporation of that city lent their assistance by supplying (at the expense of the Commission) the materials, apparatus, and tools necessary for the performance of the work, and, moreover, sent their own superintendent and paviors to execute it, so that it might be done by skilled labour, and in the best manner.

Immediately adjacent to it was laid at the same time a pavement formed of 3 inches by 7 inches

* 5s. 9d. per square yard.

Aberdeen granite, the joints being made with stone lime grout, in the usual manner. The area is 326 superficial yards, and as it is subjected to the same traffic as that with asphalt joints, a comparison of the value of the two pavements may be made at a future day.

The traffic which passed over them when first laid was about 3,800 carriages daily between 8 a.m. and 8 p.m., but when the Holborn Viaduct was opened in November, 1869, it fell to about 2,100 carriages, which is its present daily traffic during the same hours.

In 1870, 574 yards of the carriage-way of Fleet-street, next to Temple-bar, were also formed with asphalt joints, the stones being Aberdeen granite 3 inches wide and 9 inches deep; and 500 yards at the eastern end of St. Paul's Churchyard, near to Cheapside, were also formed of the same material and in the same manner. This work was done by the contractors to the Commission.

GRANITE PAVEMENTS.

Before instituting a comparison between the cost of granite and asphalt, it is necessary to make a few preliminary remarks with regard to the pavements of the City generally.

Within the City there are upwards of 900 public places, and the total length of the public-way of all classes is about forty-eight miles. Of these, about nine miles of carriage-ways are subject to the largest, most concentrated, and most destructive traffic in the world. There are, also, many miles of collateral streets which have great trades carried on in them; and have also a very large and trying traffic.

The wear from the traffic causes a large consumption of granite annually, which principally takes place in the main thoroughfares; these, therefore, need the best description of pavement, the most frequent renewal of their surface, and the most reparation.

The new granite brought in to supply this waste is in some years much larger than in others; but if, for one or two years, the supply has been small, in years following it has invariably been largely increased.

The practice pursued almost uniformly is to lay this new granite in the main thoroughfares, and when their pavements are considerably worn, and the stones require to be re-worked before they can be advantageously relaid, or an entire relay of the surface is needful, it is customary to remove the granite and lay new in its place; and thus it most frequently occurs that the pavements in main thoroughfares are removed before they are worn out.

The old material is taken to the stone yard, where it is mixed with the general stock, re-worked, sorted into sizes, and laid in other thoroughfares when needed, and it is owing to this system (which largely conduces to general convenience) that, although the cost of the repairs is accurately known, the cost of most of the pavements during a term of years cannot be arrived at, excepting by estimate.

For public convenience, the hardest, most durable, and therefore the most economical granites are not employed. From time to time, indeed, hard granites or other stones have been tried, but have invariably caused so much dissatisfaction that they had to be removed before they had been down many years, and the gray or blue granites from Aberdeen, or those of similar character, have almost exclusively been used in the City as best meeting the general exigencies of the traffic.

Other circumstances affect the cost of the pavements. For example, the stoppage of the carriage traffic when a street is paved causes both public and local inconvenience, and sometimes, in the latter case, pecuniary loss, and, with a view of obviating this as far as practicable, relays are postponed far beyond the time when economy requires that the work should be done. Consequently the stones are much more damaged, and there is much more patchwork than would be otherwise required, and patching is the least satisfactory and the most expensive of all paying works.

Even when work is ordered, there is frequently difficulty in finding convenient opportunity for doing it, for it is necessary to consult the local boards surrounding the city as to work they may contemplate, so that two parts of the same line of highway may not be stopped up at the same time. The gas and water companies also require notice, to enable them to do their pipe work, and time must elapse for the ground to consolidate afterwards. In some streets, the seasons which best suit special trades have to be taken into consideration, and days of festivity and public ceremonial have also to be considered, as they affect the traffic in main thoroughfares. These and other circumstances often prevent the pavements from being laid when it may be most economical to do the work; and

even when all arrangements are complete, wet weather may disarrange them; indeed, in wet seasons, it frequently happens that work has to be postponed until the following year.

For these and other reasons the expenditure upon pavements in the City is necessarily high; nor can the cost be reduced, excepting by the sacrifice of public or local convenience in some of the particulars referred to.

The cost of a pavement depends upon the material of which it is formed, the width of the street, the extent and nature of the traffic, and other conditions. In no two streets, therefore, is their endurance or cost the same, and the difference between the highest and lowest is very considerable. As the present object is comparison between the cost of asphalt and granite, I select Cheapside, Poultry, Old Broad-street, Moorgate-street, and Lombard-street for that purpose, they being thoroughfares which already are or are about to be paved with asphalt, and the cost of maintenance of which for seventeen years has already been arranged, and their entire expense to the Commission during that term is therefore known. These five streets also, on account of their variations in width and the nature of their traffic, may be taken as types of the leading thoroughfares of the City.

In all the estimates, I assume pavements of Aberdeen granite, with stones 3in. wide and 9in. deep, that being the class of pavement mostly used in main thoroughfares.

The prices of paviors' work have varied considerably during the last twenty years, and at present are low. Pavements of Aberdeen granite, with stones 3in. by 9in., are 15s. 4½d. per square yard. I do not think it probable that this price will continue, and for comparative estimates it will be safer to take a somewhat higher one, and I therefore take 16s. per yard, no foundations being included in that price.

(To be concluded.)

COMPETITIONS.

BLACKBURN FREE LIBRARY AND MUSEUM.—The design submitted by Messrs. Woodzell & Collcutt has been selected in this competition.

CAMBERWELL VESTRY HALL.—The twenty plans sent in in this competition are the subject of a good deal of gossip in the neighbourhood, according to the *South London Press*, and some of this gossip is not a little suggestive. For example, the other day a group of gentlemen were conversing at a street corner, and one of them ventured the suggestion that certain of the vestrymen had a personal interest in two or three of the plans sent in. "That is not the way to put it," was the significant retort; "would it not be nearer the mark to say that there are only two or three in which vestrymen have not a personal interest?" But then people are so censorious!

ARCHÆOLOGICAL.

DISCOVERY OF A LAKE DWELLING IN WIGTOWNSHIRE.—The foundations of a crannoge, or lake dwelling, have been discovered by Mr. Charles Dalrymple, Kinellar Lodge, Aberdeenshire, on a small circular island at the south end of the Black Loch, Castle Kennedy, Wigtownshire. On removing the surface soil a circle of stones was discovered, the diameter of which was between 50ft. and 60ft. On digging deeper through the stratum of forced earth and stones, 3ft. thick, what appeared to be a different and older layer of soil was reached. Among this black earth were found wood ashes, bits of calcined bones, and flat stones placed contiguously. Immediately below the stones, at the depth of a few inches, an artificial flooring was discovered, formed of the trunks of oak and alder trees. At this point the level of the loch was reached, and the influx of water prevented further excavations in a downward direction. In 1865-6, by the drainage of Dowalton Loch, in the same county, several crannoges were exposed; and in the spring of this year, when the White Loch of Castle Kennedy, which is now connected with the Black Loch by a short canal, was being dragged with a net for trout, the net brought up a canoe, of ancient make. In all likelihood it was the ferryboat used for enabling the inhabitants of the lake dwelling to go on shore when necessary to procure food and fuel.

MONKTON WYLD.—A new stained-glass window has just been placed in the west end of the nave of St. Andrew's Church, Monkton Wyld, Dorset. It is erected to the memory of the vicar's father, and contains in its two principal compartments representations of the Nativity and Baptism of our Blessed Lord. It was supplied by Messrs. Ward & Hughes, of London.

Building Intelligence.

CHURCHES AND CHAPELS.

ALDERBURY.—The parish church of Alderbury has been restored and reopened. The alterations have been carried out by Messrs. Dowler & Darlington, Shrewsbury, under the supervision of Mr. Slater, of London. The church has been considerably enlarged, the altar rails lowered, and the altar itself raised 18in. The floor has been relaid with Minton's encaustic tiles.

BATH.—Last week the foundation-stone was laid of a new chapel in Bath, for the Particular Baptists. Messrs. Wilcox & Wilson have prepared the plans. The style chosen is Gothic, of early date, and the chapel will consist of a nave, with two narrow aisles each side, and clerestory above. The material chosen is oolite, in a rough state, with Bath stone dressings. Accommodation will be provided for about 600 worshippers, and the cost of the work is estimated at £2,500.

EXTON.—A stained-glass window has been erected to the memory of the Hon. and Rev. L. Noel in the western end of the nave of the parish church, Exton. The subject selected is that of the Good Samaritan, forming richly-coloured panels, the general background of the window being of a light grisaille treatment, intersected by coloured bands, the whole enclosed by borders of colour: a floriated Latin Cross is conspicuous in the tracery.

MAIDSTONE.—The foundation-stone of the new church of St. Faith, Maidstone, was laid on Friday last. The church will be in the Early Decorated style, and the plan comprises, nave 68ft. by 30ft. 6in. north and south aisles, 61ft. by 13ft. 6in., chancel 30ft. by 26ft. with organ chamber, vestry, and tower (22ft. square), which will at some future time be surmounted by a spire, rising to a height of 170ft. from ground level. There will be two entrances to the church, the principal one being under the tower and 7ft. wide; the other at the west of the north aisle. The seating accommodation will provide for a congregation of about 620 persons. Mr. E. W. Stephens, of Maidstone, is the architect, and Messrs. Clement & Wallis, of the same place, are the contractors.

BUILDINGS.

HALIFAX.—The new north bridge at Halifax, which crosses the valley of the Hebble, and has been erected to replace the old stone structure built in 1770, was formally opened last week. The foundation-stone of the bridge, which connects two important districts of the town, was laid in April, 1869, and one half was opened for public traffic in August 1870. It consists of two elliptical iron arches, each of which is 160ft. in length, and rests on stone piers. The breadth is 60ft. and the roadway is 16ft. higher than the old bridge which formerly spanned the valley. The total cost of the work amounts to £46,000. The engineer was Mr. J. Fraser, of Leeds, and the builder was Mr. A. Neill, of Bradford.

KIDDERMINSTER.—The new cattle and wholesale vegetable market at Kidderminster was opened on Thursday week. It covers an area of about two acres. The Corporation some time ago purchased a suitable site for the market at a cost of £1,925, and Mr. Moore, the Borough Surveyor, drew up plans, from which the ground has been laid out, and the requisite buildings erected. The contractors for the work are Messrs. Goodman & Burmore, and the total cost of the market, including site, is about £4,000. The entrance-lodge and gates are in the Elizabethan style. There is a house for the superintendent of the market, and offices of the usual character. The principal entrance-gates are of cast iron. The market on the side of Market-street is enclosed for 120 yards by a dwarf wall, surmounted by neat palisades. The cattle market affords accommodation for about 240 pigs, 1,400 sheep, 80 horses, and 100 cows. In the wholesale vegetable market there is space for about 250 carts.

PLYMOUTH.—The Plymouth School Board have appointed Messrs. Norman & Hine their architects. New school buildings for 1000 children will be immediately erected.

CHIPS.

Ten thousand pounds is about to be expended in the alteration and improvement of the old cells at Coldhath-fields Prison.

The new market buildings, Bridgnorth, erected a few years ago at a cost of £8,000, were last week purchased for £2,500. The building has been unoccupied since its erection, in consequence of the opposition of the tradesmen in the High-street.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

Correspondence.

PLANNING HOUSES.

To the Editor of the BUILDING NEWS.

SIR,—I am glad to see that the important subject of the proper planning of a "gentleman's house" is about to be thoroughly discussed in your columns. I take the liberty of proposing that the BUILDING NEWS undertake the management of a competition among its subscribers for the best plans of a gentleman's country residence, to cost say £10,000 to £15,000; that you, Mr. Editor, lay down the conditions: what accommodation ought to be provided; what conveniences and comforts ought to exist, both as to general arrangement and to detail as regards the position of doors, windows, and fireplaces; also what ought to be avoided. The drawings to consist solely of plans of the two main floors, and that a few of the best be then illustrated in the BUILDING NEWS, with the names of the architects. (Sufficient inducement, I believe, to bring together a goodly array of plans.)

The profession and public would then possess some standard plans, and we should see fewer of those gross errors pointed out by some of your correspondents lately.—I am, &c.,

T. SINGLON.

39, Asker-street, Oxford-road, Manchester.

Nov. 1, 1871.

[We should be glad to undertake the management of such a competition, and beg to offer £5 5s. for the best plan. The conditions of the competition will be specified in an early number of the BUILDING NEWS.]

ARTIFICIAL STONE AS A BUILDING MATERIAL.

SIR,—Your remarks in last week's number respecting the fire at Messrs. Waterlow's and Mr. Allen's artificial stone are very interesting. Perhaps Mr. Allen will kindly give in greater detail the process of the formation of the stone—such as the requisite state of the cement—whether the coke or slag should be crushed to a definite degree of fineness, whether any sand enters the composition, quantity of water used, and whether the mixture is rammed in a mould. Answers to these questions would undoubtedly be very interesting to your readers. As to the suggestion to render construction fire-proof by covering the iron girders, &c., with this béton, it appears to me that although heat will not destroy the artificial stone, yet the material will not resist heat, but will become very hot without damage to itself; if this be the case the girders, although so encased, will still become so hot as to expand in a much greater degree than the concrete, in which case all cohesion between the two materials will be destroyed and the concrete will be broken up, not by the direct force of the heat, but by the expansion of the iron construction. Query also: May burnt clay be used with advantage with the coke, and what description of coke is best?—I am, &c.,

R. A. X.

ARCHITECTS' CHARGES.

SIR,—Will any of your numerous readers kindly afford me some information as to the course I ought to pursue under the following circumstances? I have for some time past been engaged as architect in conducting and superintending extensive alterations and improvements in a parsonage-house in a country village some distance from London. The rector, my client, being his own builder, employing his own workmen, and finding his own material, there is consequently no contract upon the amount of which to charge a commission. Would it be in accordance with general usage to charge simply for the time occupied on the work, and at what rate?

A YOUNG BEGINNER.

EMBRYO ARCHITECTS.

SIR,—Your comprehensive article on this subject clearly demonstrates the fact that out of every eight "embryo architects" but one is fitted to remain in and follow up the profession. Now I take it that "W. W.," whose letter you published last week, has proved himself to be one of the "seven," beyond the possibility of doubt. In the first place he seems to think that the sole mission of an architectural draughtsman is the outlining of Classical elevations, and says that "the average draughtsman" is incapable of this, and tries to disguise bad drawing with worse colouring, "which only make the defects more glaring."

Now who, for a moment, fails to see the superiority of a coloured drawing, when compared with one merely in line? "W. W." must know that there are other things to be studied besides form; for instance, how can the natural tints of different materials be indicated in a line drawing? Let alone *chiar' oscuro*, in itself quite important as colour, if not more so. With regard to "pen and ink" (a subject about which "W. W." waxeth exceeding wrath), I cannot imagine an artist such as is the architect of the New Law Courts adopting a style of delineation which is "absurd" according to "W. W.," a style which is increasing in popularity every day; indeed, the excellent photo-lithos which appear in this journal are, as every one is aware, nothing but "pen and ink" in principle.

Again, he objects to "imitation;" now, I am of opinion that whatever system (no matter how peculiar or unprecedented it may be) is practised by a master of his profession must be a fit subject for emulation by those who would follow in his footsteps. There are, however, a few men (professional and otherwise), who would have us believe that an architect should not be an artist in any sense of the word; that he should content himself with mechanically copying old hackneyed examples which obtained in the last century, and that any attempt at originality of design, or an endeavour to introduce an artistic effect, in any form (more particularly on paper), are but evidences of the decadence of the profession, and they shake their wise heads accordingly. But the artistic drawings of the present day bespeak artistic minds, which will not be fettered by the mechanical Classicisms of the last generation, and we may hope the majority of our "embryo architects," instead of being cast down by the old-world prejudice with which their works are regarded by some green-spectacled individuals, will continue the emulative and progressive courses which they have adopted, and make the next generation of their profession a great one.—I am, &c., J. J.

HEALTH OF OPERATIVES IN FACTORIES AND WORKSHOPS.

SIR,—Dr. Stallard's remarks at the Social Science gathering held at Leeds, as reported in your issue of the 13th ult., point to a necessity which has existed as long as bricks and mortar have known each other, namely, internal ventilation. But, while admiring the noble feeling which prompted the eminent doctor and other gentlemen to advocate the claims of the operative class, we think the subject might judiciously be pushed much further. The present system, or absence of system, which permits ladies or delicate persons of either sex to enter a church, chapel, or theatre at a temperature of say fifty degrees, and sit gradually stewing hotter and hotter, breathing other's breaths, and the poisonous influence of the gas-lights until they reach fainting heat (which we know has often happened) surely demands a remedy. Hospitals might well have a better system, too, than that of opening windows and thus placing the patients within the dangerous influence of a direct draught. And lastly, if any person would consent to enter a casual ward, a police or county court (especially on a wet day), a poor relief waiting-room, or indeed any place where the poor most do congregate—not excepting, in too many instances, their own homes—he or she would be sensibly impressed with the presence of such a vitiated or rather vile atmosphere that either his or her exit, or the ventilation of the building by an effectual plan, would appear an absolute necessity. In view of our heavy death-rate recently, we are happy to say that the principle suggested by Dr. Stallard, but simplified and improved, has been recently patented, and will shortly be offered to the public after years of study. It will likewise give us the advantage of an equalised temperature, maintained at any required degree, of purified air, and self-acting. This will be at once a preserver of health and a luxury to all classes, including our operatives.—We are, &c.,

STEVENSON, WELSH, & HOPE.

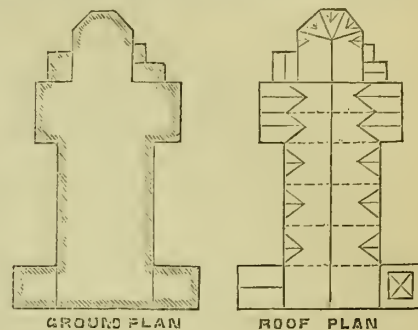
26, Lord-street, Liverpool, October 28.

Intercommunication.

QUESTIONS.

[2363.]—**Head of Water.**—In Hurst's "Formula for Calculating Water Supply and Drainage," frequent mention is made of "head of water." Will some scientific friend kindly explain the meaning of this?—MIST.

[2364.]—**Construction.**—Standing in need of the designs usual for a church, I sketched the following plan (as shown) as a suitable and efficient one for my purpose. The main roof I determined to be the hammer-



beam style, and the transepts I wish to divide into two gables, as shown (see roof plan). Which is the best construction in doing it? Ought I to throw an arch across from a pier placed between the walls (as shown), so that the roofs will rest on it, and also be a support for the principal of the nave-roof coming in between? If my method is wrong, or there is a better and more scientific way, will some efficient person interested and well up in church work kindly answer, and, if necessary, show by sketch? The principals for main roof are shown in dotted lines.—DRAUGHTSMAN.

[2365.]—**Roofing.**—Can any of the readers of this journal inform me where I can get a moderately cheap and suitable work on iron roofing, consisting of working details, &c.? Also, a late work on church architecture, containing plans, sections, details, &c., drawn to scale.—DRAUGHTSMAN.

[2366.]—**Sewage Irrigation.**—Can any reader of "Intercommunication" give me the names and prices of any works on the method of using sewage for farming purposes?—F. L.

[2367.]—**Sawing Timber.**—I want to saw some English timber into long pieces, octagon shape. By what rule can the sawyer cut them into true octagons?—S. S.

[2368.]—**Hot-Water and Warming Apparatus.**—Would some fellow-reader give the title and price of a good work on hot-water and warming apparatus in general?—HEAT.

[2369.]—**Girders.**—Can any correspondent inform me on the following points? (1) What is the rule for the "wall-hold" of girders? (2) What are the formulae for calculating (A) the strength and (B) the deflection of wrought-iron girders of cellular construction. A figured sketch of an executed example, with application of the formula in calculating its strength, would much oblige.—EXCELSIOR.

[2370.]—**Remarkable Chimney Tops.**—I have for some years past seen at No. 34, Duke-street, S. James's, four rather remarkable chimney tops. I called to make inquiries about them, but the occupier would give no information, and closed the door and conversation somewhat abruptly. Can any reader say where they can be had?—C.

REPLIES.

[2345.]—**"Proper Door-Frames."**—Referring to replies to this question in last number, it appears to me that the answers are not quite explicit. Does the term "proper door-frame" include single or double rebating? It certainly cannot include "fixing," as your correspondent suggests. The fixing would be provided thus:—Provide and "fix" proper door-frame, although, of course, in a bill of quantities, the fixing of every kind of work is assumed if not specially mentioned to the contrary.—R. M.

[2358.]—**Carpenter and Joiners' Improvement Society.**—If John W. Hardie will say where the proposed association is to be founded, and if the locality is convenient, the writer will be pleased to give some practical assistance.—ARCHITECT.

CHIPS.

The organ (by England) of S. Stephen's, Walbrook, is in the hands of Messrs. Hill & Son, to be re-built and re-erected in its old position at the western entrance.

Captain J. Britten has been elected Chairman of the Council of the Society for the Encouragement of the Fine Arts for Session 1871-72.

Steps are being taken by the Middlesex magistrates for the erection of a new lunatic asylum for the county.

LEGAL INTELLIGENCE.

IMPORTANT NUISANCE CASE IN SOUTH LONDON.—The appeal of Mr. J. A. Moore, barrister-at-law, against an order made by George Chance, Esq., one of the magistrates at the Lambeth Police-court, came on for hearing last week, before a full bench of the Surrey magistrates. Mr. S. Oppenheim appeared for the respondent, and Mr. Besley and Mr. E. G. Clarke for the Vestry of Camberwell. The principal features of the case are these: Mr. Moore is the owner of a large property known as Westwood Park, Forest-hill, which property, or part of it, has been leased to a Mr. Morris, who has underleased it to others. In 1866, Mr. Moore, through his surveyor (Mr. Fogarty), submitted a plan of draining the whole of the said estate to the Camberwell Vestry, by whom it was approved, as also by the Metropolitan Board of Works. For some reason or other this system of drainage was not carried out, probably the land not letting for building purposes so well as Mr. Moore had anticipated, the result being that certain houses that were already built on the estate, just on the brow of a hill, were deprived of all chance of carrying off their sewage unless the occupiers or leaseholders consented to pay to Mr. Moore a sum of £500, thus being made to contribute not only their own share towards carrying out the entire drainage of the estate, but also paying a large item for the benefit of Mr. Moore. The consequence of this was that cesspools had to be used, and from the peculiar position of the property on a hill, with a gradient of about 1 in 12, these cesspools were continually overflowing, and discharging the soil from the houses into a ditch on Mr. Moore's land, which also quickly filled up, and then this fetid matter, discharging itself on the land, became a nuisance of so foul a character as to be most injurious to health. In the autumn of 1869 the vestry directed summonses to be taken out against the owners and occupiers, and orders were made upon them to construct larger and more improved cesspools for each house (but as a temporary measure only), the position of the houses being such that it would always only be a matter of time as to the frequent recurrence of the nuisance, as it afterwards proved. Things went on in this state till August last, and all negotiations with Mr. Moore or the owners proving equally futile, the vestry then determined to again summon the owners and occupiers, as also Mr. Moore, at the Lambeth Police-court, for permitting a nuisance to exist on their land and premises by which human life was endangered. The case was heard before Mr. Chance, one of the Lambeth magistrates, and after going minutely into the whole of the evidence, he decided that Mr. Moore was responsible for the nuisance, ordered the same to be removed forthwith, prohibited a recurrence thereof, and also ordered Mr. Moore to lay down such structural works as would remedy the nuisance. It was against this order that Mr. Moore last week appealed. The case was opened by Mr. Besley, who strongly commented on the act of injustice that was attempted to be forced upon the lessees by trying to compel them to pay the £500 towards the system of drainage, as proposed by him, and said that as the nuisance had since been removed—the vestry having put in force the powers vested in them under the 22nd section, and of their own accord put down a pipe sewer of sufficient dimensions to carry off the drainage from the houses—it was very evident that all Mr. Moore wanted was to nullify the validity of a piece of paper, especially as the cost of the work would have to be borne by the several owners of the houses, according to their respective proportions; and, furthermore, to show the spirit in which Mr. Moore was working, he had, since the case was heard, served a notice of ejectment upon each of the owners. The only witness heard in the case was Mr. Reynolds, surveyor to the parish, who very clearly proved to the Court the nature of the nuisance, the different methods that had been adopted to remove the same, and the step that had now been taken by the vestry, and which he said was the only practicable one to be done in such a case. On being cross-examined by Mr. Oppenheim, he said that if the law were altered and builders were compelled, under heavy penalties, to construct the sewers before attempting to build houses on the land, no such nuisance could ever exist. On Dr. Aldons being put in the witness-box, Mr. Oppenheim stated that he was prepared to admit on the part of his client that a nuisance had existed, and also one injurious to health. No more witnesses being called on either side, Mr. Oppenheim addressed the Bench in a long and voluminous speech, occupying nearly three hours, treating the case technically on its legal merits. He endeavoured in every point to prove that Mr. Moore was not the owner, as implied by the act, and inasmuch as a notice of appeal was given within seven days after the serving of the order, he contended that Mr. Chance's order was illegal; and also that the vestry had no power to lay down such works till after the hearing of the appeal. After some consultation the chairman stated that it was the unanimous opinion of the Court that the appeal against Mr. Chance's order should be dismissed with costs. Mr. Oppenheim then asked for a case, which, not being objected to by the opposing counsel, was granted.

COURT OF BANKRUPTCY, OCTOBER 25.—**Re WILLIAM GIRLING.**—(Before Mr. Registrar Roche, sitting as Chief Judge.)—Mr. Brough applied for the appointment of Mr. John Bath, accountant, King William-street, as receiver, and for an interim injunction to restrain proceedings by creditors under a petition for liquidation filed by William Girling, carrying on business as a builder at Bromley, Middlesex. The debts were about £300, and assets £180. Both applications were granted.

DISPUTE AS TO THE PRICE OF TIMBER.—**SIMPSON v. DOWNES.**—This case was decided on Wednesday, the 18th inst., in the Ipswich County Court, by J. Worlidge, Esq., the judge. The action was brought by plaintiff, a timber merchant at Needham Market, to recover from the defendant, the rector of Baylham, £45 18s. 8d., a balance alleged to be due for oak and chestnut boards, and for labour supplied in connection with the restoration of Baylham Church. The particulars were:—For oak planks and boards, £106 8s.; chestnut planks and boards, £6 6s. 11d.; labour in sawing, &c., £13 3s. 9d.; amounting to £125 18s. 8d. Credit was given for £80, leaving a balance of £45 18s. 8d. With respect to the chestnut planks and the sum charged for labour, no material objection was raised, but with respect to the oak planks and boards, Mr. Harper, of Hadleigh, who appeared for the defendant, objected to the price charged for the oak—viz., 5s. per cubic foot, alleging that it should have been charged 4s. per cubic foot, also to the quantity charged for, and the quality of the oak. With respect to the quality no sufficiently definite evidence was given to enable his Honour to give effect to the objection. As to the price, Simpson and his foreman, William Mulley, swore that the price agreed upon was 5d. per inch, or 5s. per cubic foot, and evidence was given that that was a fair price for such oak as plaintiff supplied. On the other hand, Mr. Chapman, agent for Sir George Broke-Middleton, who at Mr. Downes's request saw plaintiff with reference to the matter, said plaintiff offered to supply the timber at £8 per load, which was 4s. per cubic foot, and that when he had delivered timber to the amount of £60, plaintiff came to him and said he must have £10 per load. He told plaintiff that he must see Mr. Downes, but it did not appear that he did so. Mr. Downes also stated that the price he agreed upon with Simpson was £8 per load; that Mulley was not present when the agreement took place, and, further, that Mulley had told him so himself. It also appeared that Day, the contractor, supplied some oak as well as Simpson, and that he charged 5s. per foot scantling—i.e., Day took the waste, and he said that as plaintiff took the waste, 4s. per foot was a fair price. He also said that some oak sent for back panels was unfit for the purpose. His Honour said, the evidence being contradictory, he asked himself whether there was an independent witness. He thought Mr. Chapman such a witness, and upon this evidence decided the question of price in defendant's favour. With respect to the quantity, if plaintiff's books were correct, plaintiff supplied all the oak charged for. On the other side there was no evidence given to show that any particular planks or boards set down in Simpson's books were not supplied, but after the work was done the oak in the church supplied by Simpson was pointed out by Day and his foreman to Mr. Hewitt, builder and surveyor, Ipswich, who measured it up and found 190ft. Simpson charged for about 425 cubic feet, which leaves 235ft., or 55 per cent., for waste, and it was deposed on defendant's side that 25 per cent. was a liberal allowance for waste, and that it was impossible that defendant could have supplied all this timber when so little was found in the church. His Honour remarked that it would have been more satisfactory if plaintiff had had an opportunity of being present when Mr. Hewitt measured the oak. When the oak left Simpson's premises it left his control, and he was in no way responsible for what became of it. On the theory set up for the defence, he must convict Simpson of having wilfully made false entries in his books, and then committed perjury in swearing to the correctness of them. He could not do that, and therefore decided the question of quantity in plaintiff's favour; in doing so he threw no imputation on anybody else; he merely said he did not know what became of the oak. His Honour allowed £82 8s. 6d. for the oak, and the full amounts claimed for the chestnut planks and labour. Deducting the £80 for which credit was given, he gave judgment for £21 19s. 2d., with costs, payable in fourteen days.

CHIPS.

There are hundreds of houses in South London, says the local *Press*, not yet connected with the main sewers. In the event of any epidemic, a heavy responsibility will rest upon all concerned.

Negotiations are in progress for the purchase of a site for the erection by the Metropolitan Board of Works of a fire-engine station in the Lower Wandsworth-road.

It was decided on Friday last by the Metropolitan Board of Works that the cost of lighting and paving the Thames Embankment should be charged to the whole metropolis, instead of the parishes in which it is situated.

WATER SUPPLY AND SANITARY MATTERS.

LONDON WATER SUPPLY.—A bill is in course of preparation, and will be laid before Parliament early next session, to supply London with water from the Cumberland lakes.

EAST LONDON WATER SUPPLY.—The directors of the East London Water Works have (says the *City Press*) announced their intention of at once substituting the constant for the intermittent supply system in all the houses furnished with water by the company, thereby following the example of the New River Company. The inhabitants of the company's district have accordingly received instructions to prepare for the change by providing themselves with the necessary fittings, &c., so that loss may be avoided. Failing these alterations, the directors intimate that the constant supply will not be forthcoming.

Our Office Table.

PROPOSED NEW PARK FOR CAMBERWELL AND PECKHAM.—At the last meeting of the Camberwell Vestry it was resolved: "That it be referred to a special committee, to consist of the parish officers and two members from each ward, to consider and report to this vestry as to the measures which it would be expedient to adopt in order to secure the formation of a park adjoining to or in connection with Peckham Rye Common. Also, that they prepare and submit for the approval of the vestry such a representation as they would suggest should be presented to the Metropolitan Board of Works to induce that Board to obtain powers to form this park as proposed." We should have thought that with the bye the inhabitants of this locality would consider themselves pretty well off for open spaces. In support of the resolution it was urged that "it was impossible to walk over Peckham Rye with safety because of the boisterous games carried on there!"

TECHNICAL EDUCATION.—On Monday the Lord Mayor distributed the prizes gained at the small but very interesting exhibition of articles in wood-turning, which has been held at the Mansion House during the last few days, under the auspices of the Master, Wardens, and Courts of Assistants of the Company of Turners, one of the guilds of the City of London. The judges were Mr. Charles Hutton Gregory, Mr. John J. Holtzapffel, and Mr. John Jaques—all citizens and turners—and they awarded the prize of this year to Mr. W. H. Ridout. It consisted of a large and handsome medal in silver gilt, bearing on one side the arms of the company and on the other the name of the successful competitor, with an inscription that it had been awarded to him, together with the freedoms of the company and of the City, for superiority in hand-turning in the competition of 1871. The Lord Mayor observed that steps were being taken by some of the City companies in that direction. The Painters' and Paper Stainers' Company was as yet almost the only one that had done anything practical in that way; but if the Goldsmiths' and Merchant Taylors' Companies, with the wealth and public spirit for which they were famous, were to offer inducements for the cultivation of the special arts and manufactures which they in early periods of our history patronized and controlled, and if other companies would do the same he was convinced it would be a movement eminently conducive to the public good. The Turners' Company had set a laudable example, and he was delighted to see in the Mansion House so many creditable specimens of their handicraft.

SOUTH KENSINGTON SCHOOL OF ART.—Dr. G. G. Zerffi will commence on Tuesday next, November 7, a course of forty lectures on the Historical Development of Ornamental Art with special reference to Architecture, Sculpture, and Painting. The lectures will be delivered at 3 o'clock p.m. every following Tuesday in the lecture-theatre of the Museum. The public are admitted on paying a nominal fee.

THE ALBERT MEMORIAL CHAPEL AT WINDSOR.—Few people, remarks the *Guardian*, have yet been permitted to inspect the works now in progress in Wolsey's Tomb-house at Windsor. These few, however, will hear with regret that, owing to the conclusion of peace on the Continent, the works have again commenced, and are, in fact, almost concluded. Magnificent (perhaps gaudy is a preferable expression) and costly the decorations certainly are; but the building is ruined, nay, absolutely disfigured as well by the process. Imagine a Perpendicular chapel, with an exquisitely groined-roof and traceried windows in the latest development of the style; imagine its walls lined with drab German marble arranged in a pseudo-Byzantine design, with panels representing Scriptural scenes of the poorest modern

German School in various shades of the same colour, with the addition of black and white in places; and imagine the fretwork of the roof filled with Italian glass mosaic, and the windows—well, we have said enough; but ought to add we have reason to state that the work has been wholly carried out by foreign workmen, designed by foreign artists, and executed in foreign materials. There is some satisfaction in remembering Englishmen have had no hand in it.

LONDON AND NORTH-WESTERN RAILWAY.—The directors of the London and North-Western Railway Company have determined on the immediate construction of another double line of rails between Stafford and Crewe. The contract for the embankments, cuttings, &c., has been let to Mr. Moss, of Stafford. The cost will be nearly £120,000, and the work will employ 800 men for two years.

MARQUARD'S ARTIFICIAL STONE.—An American journal speaks in high terms of a new compound, the result of experiments made by Phillip Marquard, Buffalo, N. Y., noticeable for its pure whiteness, semi-translucency (like marble), and the ease with which it appears to have been moulded. It takes polish like marble, and is said to be capable of standing the severest weather, as water does not penetrate it in the least. Chemically, it is silicate of lime, with an excess of the latter; it also contains some alumina. The inventor states that it is far cheaper than any natural stone worked by hand; and does not shrink in burning, coming out of the fire exactly equal in size and form as it came from the mould.

BATH ABBEY.—The base of another column of Bishop John de Villula's Church, several remains of which were found during the restoration of the nave, and are observable on the eastern exterior, has been uncovered in the choir, in the same relative position to the present extreme column on the north-east as those in the rear bear to their adjacent pillar. It is to be expected that other remains will be disclosed as the excavation proceeds, from which the extent of the former structure may be determined.

PALESTINE EXPLORATION FUND.—The new expedition, which has been in preparation for a considerable time, has just started for the Holy Land. It has been placed under the charge of Captain R. W. Stewart, R.E. He has under his orders two experienced non-commissioned officers of the Royal Engineers, Sergeant Black and Corporal Armstrong, and the party will be joined before Christmas, it is hoped, by Mr. C. F. Tyrwhitt Drake. Mr. Drake was last year with Mr. Palmer in the desert of the Tih, and has since done a great deal of work with Captain Burton, the celebrated traveller, in the Hauran, round Damascus, and in the Anti-Lebanon. He is also an Arabic scholar, an archæologist, and a naturalist of great eminence, and his experience in all these branches will be of the greatest service to the party. Captain Stewart's main work will be the completion of the survey of Palestine. They will also examine the mounds which are found dotted all over the country; sketch and photograph the ruins which lie on the hill tops; collect the traditions, and copy the inscriptions. The committee's programme embraces a period of three or four years to complete a work which costs little, and is of an importance not only national, but universal. The Americans, at the same time, are preparing an expedition for the East of Jordan, where their work will lie. The results of the two expeditions will be published at regular intervals, and simultaneously.

PROPOSED TRAMWAY TO THE CRYSTAL PALACE.—At last week's meeting of the Lambeth Vestry, a letter was received from Mr. J. D. Gover, solicitor, of Old Jewry, intimating an intention on the part of a company to apply, under the provisions of the Tramway Act, 1870, for powers to lay and work a line of tramway between Camberwell Park and the Crystal Palace, three miles and three-quarters in length. From Camberwell-green to Blackfriars and Westminster bridges there is already tramway communication.

PROPOSED STREET IMPROVEMENTS IN CENTRAL LONDON.—Several of the vestries and district boards of works of central and north-eastern London are taking steps to unite together in an agitation for the formation of the long-proposed new street from Goswell-road (opposite the end of Old-street) to Hart-street, Bloomsbury, and New Oxford-street. It is urged that by widening Wilderness-row for its whole length, and carrying the new street across Clerkenwell-green, and along Liquorpond-street (which would require widening) to the King's-road and Theobald's-road (the latter thoroughfare also requiring to be widened), a good line of thoroughfare would be obtained from Shoreditch Church and the Hackney and Kingsland-roads to Oxford-street, at a comparatively small cost. We should like to see something

done, also, in the way of carrying the new Charterhouse-street (which runs from Holborn Circus along the north side of the new Metropolitan meat market, Smithfield, but stops short just this side of Charterhouse-square), to its legitimate termination—i.e., at a point opposite Old-street in the Goswell road, a little south of Wilderness-row. This would greatly relieve the heavy traffic on Long-lane, besides completing a fine, wide, and straight line of street extending from Shoreditch Church to Holborn Circus.

OLD CITY BURIAL GROUNDS.—Here and there about the city of London curious pedestrians may have observed little patches of ground enclosed by railings, the peculiarity of which is that no gate or door gives access to them, while the rank grass and weeds which cover their surface are left to struggle for existence in the smoky air. Sometimes a tablet against an adjacent wall informs the public that "before the dreadful fire" here stood the church of the parish. In fact, these patches are the old grave-grounds of churches which it was not deemed advisable to rebuild after the fire; and it is now evident that many more such enclosures will soon be divorced from the church with which they have for ages been associated; for on Sundays our city is deserted, congregations are thinned down to two or three old women and a few children, and, as a consequence, the work of pulling down these edifices and rebuilding them in the suburbs is steadily advancing. Under these circumstances some interest attaches to a movement set on foot by the Board of Works for bringing not only all these stray plots, but all the disused grave-grounds of the metropolis, under their control. Some of them have historical and biographical associations which, in the eyes of the learned, give them a special interest, but all are valuable as open spaces in a city sadly wanting in pleasure-grounds. The Board are anxious to adorn these neglected spots and preserve them for public use, and few suggestions could be more worthy of sympathy. In one or two parishes this suggestion has already been acted upon. Grass and flowers, and even fountains dropping water into stone basins filled with goldfish, occasionally refresh the eye of the citizen where lately were only green moss and mildew; but, unfortunately, the vestries have no funds for this purpose, and (says the *Graphic*) without some new powers from the Legislature, the suggestion may prove abortive.

LEEDS ART WORTHIES.—From the ranks of Leeds workers (says the *Athenæum*, in an interesting article on Leeds and its associations, *apropos* of the Social Science Congress) have issued some of the men whom Leeds is proud of having for native townsmen. Ralph Thoresby, whose career extended from 1628 to 1725, forgotten as a toiling merchant, is remembered in the fruits of his leisure, devoted to the topography of his birthplace. Another Leeds man, Benjamin Wilson, the figure and landscape painter, who died in 1788, was of very humble origin. He was not equal to his namesake, our English Claude, poor beer-swilling, red-nosed Dick Wilson; but the pupil of Hudson and the master of Zoffani was an able and original artist, and cleverer than the other Wilson in this, that he contrived to get the appointment of Master Painter to the Board of Ordnance—a sinecure of "the good old times," which brought the holder £800 a year. Leeds also gave to Art, Lodge, the engraver and painter, who, like his contemporary Congreve, abandoned the study of the law to follow a more genial avocation.

A SUBURBAN NUISANCE.—Trees (remarks the *Globe*) are no doubt ornamental enough in their place. But why should they be suffered to hang over the footpaths, strewing the streets with dead leaves, and making a heap of decay round every lamp-post, or ruffling our hats and tempers with their soppy leaves, as we brush under them? The nuisance of awnings, by good luck, does not much affect umbrellas, open awnings and open umbrellas seldom existing together, but with respect to trees drooping over the street, the foot-passenger, even if his rights do not extend *usque ad cælum*, is entitled to at least an umbrella's length of uninterrupted space above his head. The encroachment of trees from the front gardens into the street in suburban districts is a nuisance in all weathers, especially in the autumn, and those who have not acquired a philosophical patience for these trifles must content themselves with the luxury of grumbling, as there is not the smallest chance of a cure being applied to a matter so easily remedied.

THE TOMB OF THE AUTHOR OF "THE CHRISTIAN YEAR."—After an interval of five years and a half, two monuments have been erected to mark the resting-places of the Rev. John Keble and his wife. They have been designed by Mr. Butterfield, and consist of large and ponderous slabs, ornamented with foliated crosses, and raised upon plinths, with a solid base of York stone. The two monuments are of

the same size and general design, and are alike in material, except as regards the large coped slab forming the cross, which in Mr. Keble's monument is made of highly-polished red Scotch granite, and in Mrs. Keble's of polished Derbyshire fossil marble, which latter material is also used for the plinth of both, while the space containing the inscription, between the plinth and the coped stone, is filled with smooth but unpolished Sicilian marble. The foliated crosses on the two graves are very different from one another in design, and on Mr. Keble's grave there is carved in bold relief upon the sloped coping, about the middle of the stem of the cross, on the north side, a Bible, and on the south side a chalice, to mark the grave as that of a priest.

CHIPS.

Mr. W. C. Thompson has been appointed to take charge of the vacant lands of the Corporation.

New schools were recently opened at Radley-green, Writtle, Essex. The building was erected by Mr. John Ellis, of Willingale, from a design by Mr. Walter MacCarthy, architect. The cost was £350.

The new church of All Saints', Grosvenor-road, Picnic, was consecrated on Tuesday last.

It is in contemplation to enlarge Kensington Workhouse.

The theatre at Darmstadt has been completely destroyed by fire, the outer walls and the stone staircase alone remaining.

A committee of the Metropolitan Board of Works has decided to recommend the widening of Wapping High-street as a metropolitan improvement.

The council of the Royal Archaeological Institute have decided upon holding the annual meeting for 1872 at Southampton.

On Thursday, October 26th, Lord de Tabley performed the ceremony of opening a new wing erected at the Stockport Industrial School at Townend, near S. Thomas's Church, Stockport.

The Countess of Dudley formally opened the Guest Hospital, Dudley, on the 25th of October.

A project for uniting the Black and Caspian Seas by canal is reported to be at the present time engaging the attention of the Russian Government. The originator is stated to be Captain Blum; the estimated cost 81,000,000 roubles.

Mr. Hatton, of Hatton, near Warrington, has presented the Warrington Dispensary with £5,000.

Mr. Cornelius Sherlock, architect and surveyor, Liverpool, has been appointed surveyor for the diocese of Chester, under the Ecclesiastical Dilapidations Act of last session. Mr. Bell has been appointed to a similar post in the Manchester diocese.

The new Foreign Cattle Market at Deptford (on the site of the old dockyard) will be ready for opening in December.

Timber Trade Review.

PRICES, October 30, per Petersburg standard hundred.—Archangel best yellow, £12 10s. to £14 15s.; ditto second quality yellow, £9 10s. to £10; Petersburg best yellow, £13 to £13 10s.; Wyburg best yellow, £10 to £10 15s.; Finland and hand-sawn Swedish, £7 10s. to £8; Petersburg and Riga white deals, £3 15s. to £9 5s.; Christiania deals, best sorts yellow and white, £10 to £12 10s.; Norway deals, other sorts, £7 to £8; ditto battens, all sorts, £5 10s. to £7; Swedish and Gothenburg, good stocks, £10 to £10 15s.; common and thirds, £8 10s. to £9 10s.; Gelle and best Swedish deals, £10 10s. to £12 10s.; Swedish battens, £8 to £9 10s.; Quebec yellow pine, first quality floated, £16 10s. to £18; ditto second quality floated, £12 10s. to £13; ditto third quality floated, £8 10s. to £9; ditto first quality bright £18 to £19 10s.; ditto second quality bright, £13 5s. to £13 10s.; ditto third quality bright, £8 15s. to £9 5s.; New Brunswick mixed pine, £7 to £8 5; Canadian spruce, first quality, £9 10s. to £11; ditto second quality, £8 to £9 5s.; ditto third quality, £7 10s. to £7 15s.; ditto unsorted, £8 to £8 5s.; Nova Scotia and Prince Edward's Island, £7 5s. to £7 15s.; spruce battens, £7 to £7 10s.; United States pitch pine planks, £12 10s. to £13 5s.

Timber, per load of 50 cubic feet: Pitch pine, £3 10s. to £4; Quebec oak, £6 to £6 5s.; ash, £3 10s. to £4 15s.; Quebec birch, large sizes, £3 15s. to £5; New Brunswick and Prince Edward's Island birch, £2 15s. to £3 10s.; ditto small averages, £2 10s. to £3 5s.; Dantzic and Memel crown fir, £4 to £4 10s.; ditto best middling, £3 5s. to £3 15s.; ditto good middling and seconds, £3 to £3 5s.; ditto common middling, £2 10s. to £2 15s.; ditto under-sized, £2 10s. to £2 15s.; Stettin, £2 10s. to £2 15s.; Swedish, £2 5s. to £2 15s.; Swedish and Norway balks, £1 12s. to £1 18s.

BREAKFAST.—EPPS'S COCOA.—GRATEFUL AND COMFORTING.—By a thorough knowledge of the nature laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. "Civil Service Gazette." Made simply with Boiling Water or Milk. Each packet is labelled—"JAMES EPPS & Co., Homoeopathic Chemists, London." Also, makers of Epps's Milky Cocoa (Cocoa and Condensed Milk).

Trade News.

WAGES MOVEMENT.

GLASGOW.—At an aggregate meeting of the joiners in the Glasgow district, held in the Trades' Hall, Glasgow, recently, it was resolved to refuse, after intimation had been given to their employers, to fit up finishing and other work done by joiners working ten hours per day. It was also agreed to demand an advance of a halfpenny per hour on the present rate of wages—the advance to come into operation on and after the 1st of March next. A committee was appointed to carry the resolutions into effect.

MORLEY.—The joiners in Morley are on strike. The advance of 2s. per week all round, and reduction of hours at the present time, with a further reduction of four hours per week on the 1st of January, are the concessions sought by the men. The building trade in Morley has been unusually brisk, and the men hope that their ends will be attained.

RAILWAY EMPLOYEES AND THE SHORT TIME MOVEMENT.—A memorial is in course of signature by the workmen employed in the locomotive and carriage departments of the South Western and the London, Chatham, and Dover Railways.

REPORTED "NEW ALLIANCE" FOR ARBITRATION IN STRIKES.—The London correspondent of the *Scotsman* writes:—"I believe it is not generally known that some time ago a number of the members of the Social Science Association, acting in concert with some of the leaders of the 'skilled workmen' class, formed what they called a 'Capital and Labour Committee,' for the purpose of promoting arbitration for the prevention of strikes, and otherwise reconciling the interests of capital and labour. A very large number of persons form this committee; Mr. Gladstone is President, and Mr. Thomas Brassey, M.P., is the Chairman of the Executive Committee. An assessment upon the members, or voluntary contributions from them, form a considerable fund, and a very well-known leader of the 'skilled workmen' is retained as the salaried agent of the committee."

THE NAIL TRADE.—At a meeting of nailers held on Monday at Bromsgrove it was unanimously resolved to give the masters notice of a rise of 10 per cent. in wages, to commence on Saturday next. A deputation appointed to wait upon the masters reported that only one of them was willing to give the increase. If the men's demand is not conceded another meeting will be held on Monday next.

WISHAW.—The quarriers' strike at Wishaw still continues. A great number of the men are leaving the locality and getting work elsewhere.

TENDERS.

CATERHAM JUNCTION.—For detached house, Lower Foxley Park Estate. Mr. Richard Martin, architect:—
Saker £829
Ward 795

FOLKESTONE.—For the erection of new National Schools, with master's residence, for the parish of St. Peter. Mr. S. Slingsby Stallwood, architect:—

Unwin	£1323
Prebble	1294
Baker	1180
Adcock & Rees	1175
Brooks & Co.	1145
Bowley	1120
Dunk (accepted) ..	1023
Holdom	1020
Webster	989

HIGHBURY.—Post-office, coal office, and shop premises, for the North London Railway Company. Mr. E. H. Horne, architect:—

Eaton & Chapman ..	£2492
Bracher & Son	2426
Foster	2382
Scrivenor & White ..	2350
Hill, Keddell, & Waldram ..	2317
Sewell & Sons	2307
Wicks, Bangs, & Co. (accepted—cost reduced to £2,000) ..	2238

LONDON.—For works at No. 49, St. James's-street, for T. R. Marshall, Esq. Mr. Peebles, architect. Quantities not supplied:—

Hoare & Postlewaite ..	£916 6
Smith	884 0
McCormick	840 0
Taylor	785 10
Benstead & Sons	737 0

MALVERN.—For new villa residence, for the Rev. Chas. Lee, H. and G. C. Haddon, architects. Quantities supplied:—

Wood & Sons	£1493
Davis	1390
Porter	1375
Everal	1345
Inwood (accepted) ..	1298

MILL HILL.—For the erection of a Franciscan Convent, proposed to be erected for the Superiress. Messrs. Goldie & Child, architects. Quantities supplied by Mr. James Schofield:—

King & Sons	£5416
Patman & Fotheringham ..	5198
Jackson & Shaw	4993
Myers & Sons	4987
Longmire & Burge	4800
Gammon & Sons	4797
Hill, Keddell, & Waldram (accepted) ..	4615
Bueysson & Co. (too late) ..	4572

ST. JOHN'S WOOD.—For additions, &c., to No. 51, Wellington-road, for G. E. Smale, Esq. Mr. Peebles, architect. Quantities not supplied:—

Kiddle	£741 5
Tavener	631 18
Bird	547 0
Taylor	494 0
Benstead & Sons	452 0

CONTRACTS OPEN FOR BUILDING ESTIMATES.

CHELTEMHAM, Dec. 9.—For the erection of a Ladies' College.—Messrs. Middleton and Goodman, Architects, 1, Bedford-buildings, Cheltenham.

ARMLEY (near Leeds), Nov. 28.—For rebuilding the Church of St. Bartholomew.—Messrs. Walker and Athron, Architects, 11, East Parade, Leeds.

WAR DEPARTMENT CONTRACT, Nov. 7.—For the erection of a sergeants' mess establishment at Bradford Barracks.—Colonel W. G. Hamley, Royal Engineer Office, Manchester.

BRADFORD, Nov. 6.—For the construction of covered channels in connection with the Bradford Beck.—W. T. McGowen, Town Clerk, Corporation Office, Swain-street, Bradford.

ACTON, Nov. 14.—For the supply of 1,500 yards of gravel.—E. Monson, C.E., Surveyor to the Board, Acton.

WAR DEPARTMENT CONTRACT, Nov. 10.—For the erection of soldiers' barracks for 100 men, with cook-house, &c., at Maidstone.—Royal Engineer Office, Chatham.

OLDHAM, November 14.—For erecting a gantry at Werneth, for the Lancashire and Yorkshire Railway.—Engineer's Office, Hunt's Bank, Manchester.

DOVER, November 11.—Annual contract for materials for Harbour Board.—Mr. Stillwell, Dover.

PENNRIDGE, December 16.—For alterations and additions to "The Byett's."—Messrs. Middleton and Goodman, architects, 1, Bedford-buildings, Cheltenham.

SURREY, November 21.—For dredging mud from the Surrey Commercial Docks by steam dredgers, and lightening away, landing, and disposing of the mud on land to be found by the contractor.—J. Griffin, secretary, 106, Fenchurch-street, London, E.C.

CHORLTON, November 14.—For the supply and erection of apparatus for the manufacture and storage of gas at the Union Workhouse, Withington.—W. N. Edgill, Clerk to the Guardians, Union Offices, Grosvenor-square, All Saints', Manchester.

WYMONDHAM CHARITY, November 6.—For repairs and alterations to the Chapel of St. Thomas A'Becket.—Mr. E. J. Howlett, Solicitor, Wymondham, Norfolk.

WALTHAMSTOW, Nov. 3.—For the enclosure of their new burial ground, by oak park pale fencing, about 5ft. 6in. high.—William Houghton, Clerk to the said Board, 15a, S. Helen's-place, Bishopsgate-street, London.

BATH AND OTHER BUILDING STONES, OF BEST QUALITY.

RANDELL, SAUNDERS & CO., Limited, Quarrymen and Stone Merchants.

List of prices at the Quarries and Depôts, also cost of transit to any part of the United Kingdom, furnished on application to

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TO ARCHITECTS.

GREEN ROOFING-SLATES.

Assupplied to H.R.H. The Prince of Wales at Sandringham

The Penmoyle Sea-green Slates are specially adapted for Churches, Public Buildings, &c., &c.

(Less costly than ordinary Gothic Tiling.)

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LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

LEAD.			
Pig—Foreign	per ton	£17 10 0	£18 0 0
" English W.B.	do	20 5 0	20 10 0
" Lead Co.	do	18 10 0	18 15 0
" Other brands	do	18 0 0	18 5 0
Sheet Milled	do	18 10 0	19 0 0
Shot, Patent	do	20 10 0	21 0 0
Red or minium	do	20 10 0	0 0 0
Litharge, W.B.	do	0 0 0	0 0 0
White Dry	do	25 10 0	26 0 0
" ground in oil	do	0 0 0	0 0 0

COPPER.			
British—Cake & Ingot ..	per ton	£74 0 0	£76 0 0
Best Selected	do	76 0 0	78 0 0
Sheet	do	76 0 0	81 0 0
Bottoms	do	81 0 0	83 0 0
Australian	do	75 0 0	78 0 0
Spanish Cake	do	68 0 0	70 0 0
Chili Bars, cash	do	67 0 0	69 0 0
" Refined ingot	do	75 0 0	0 0 0
Yellow Metal	per lb.	0 0 6½	0 0 7½

IRON.			
Pig in Scotland, cash ..	per ton	£3 3 8	£0 0 0
Welsb Bar, in London ..	do	7 15 0	8 15 0
" do. do. in Wales ..	do	6 15 0	7 10 0
Staffordshire	do	8 15 0	9 10 0
Rail, in Wales	do	6 15 0	7 5 0
Sheets, single in London	do	10 10 0	11 5 0
Hoops, first quality ..	do	10 0 0	10 10 0
Nail Rod	do	8 15 0	9 5 0
Swedish	do	10 0 0	11 0 0

OILS, &c.			
Seal, pale	per tun	33 10 0	0 0 0
Sperm body	"	80 0 0	81 0 0
Cod	"	33 0 0	0 0 0
Whale, South Sea, pale ..	"	33 10 0	0 0 0
Olive, Gallipoli	"	21 0 0	0 0 0
Cocunut, Coclbin, tun ..	"	61 0 0	0 0 0
Palm, fine	"	39 0 0	0 0 0
Linseed	"	34 10 0	0 0 0
Rapeseed, Eng. pale ..	"	47 10 0	0 0 0
Cottonseed	"	34 15 0	35 0 0

TIMBER.			
Teak	load	12 10 0	13 10 0
Quebec, red pine	"	3 15 0	4 15 0
" yellow pine	"	4 5 0	5 5 0
Quebec oak, white	"	6 0 0	6 5 0
" birch	"	3 15 0	5 0 0
" elm	"	3 10 0	4 0 0
Dantzic oak	"	4 10 0	6 10 0
" fir	"	2 7 0	4 0 0
Memel fir	"	3 0 0	3 5 0
Riga	"	3 0 0	3 10 0
Swedish	"	2 0 0	2 10 0
Masts, Quebec red pine ..	"	4 0 0	6 10 0
" yellow pine	"	4 0 0	6 10 0
Oregon	"	7 0 0	10 0 0
Latwood, Dantzic, fm. ..	"	3 0 0	5 0 0
" St. Petersburg	"	5 10 0	6 15 0

Deals, per C, 12ft. by 3 by 9in.	"	12 0 0	18 0 0
Quebec, white spruce ..	"	12 0 0	14 0 0
St. John, white spruce ..	"	12 0 0	14 0 0
Yellow pine, pr reduced C	"	18 10 0	20 0 0
Canada, 1st quality ..	"	13 0 0	14 10 0
" 2nd do.	"	12 10 0	14 10 0
Archangel, yellow	"	12 10 0	13 10 0
St. Petersburg, yellow ..	"	6 15 0	7 15 0
Finland	"	0 0 0	0 0 0
Memel and Dantzic	"	8 10 0	10 10 0
Gotenburg, yellow	"	8 0 0	9 0 0
" white	"	10 10 0	12 10 0
Geffe, yellow	"	8 10 0	12 0 0
Soderham	"	10 0 0	12 10 0
Christiania, per C, 12ft. by 3 by 9in., yellow ..	"	7 0 0	8 0 0
Other Norway	"	0 9 0	0 10 0
Flooring boards, pr square of lin., first yellow ..	"	0 8 0	0 9 0
First white	"	0 6 0	0 8 0
Second qualities	"		

BANKRUPTS.

TO SURRENDER IN THE COUNTRY.

Arden Hinkley, Sittingbourne, Kent, brickmaker, November 10.

Jane Curry, Newcastle-upon-Tyne, builder, November 14.

PUBLIC EXAMINATIONS.

November 21, T. Ricketts, Middleton-road, New Wandsworth, superintendent gas engineer.

November 28, K. Peters, Ashford, Kent, builder.

DECLARATIONS OF DIVIDENDS.

John Edwards, Manchester, timber dealer, second div. of 2s.

Henry Woodall (separate estate), Dudley, iron merchant, first div. of 2 3-16d.

DIVIDEND MEETINGS.

November 14, W. Farmer, Newington-causeway, horticultural builder.—November 14, R. Yeomans, Little Gonerby, painter.—November 14, T. Hoe, Bottesford, Leicestershire, brickmaker.—November 14, G. Hawley, Colsterworth, Lincolnshire, stonemason.

PARTNERSHIPS DISSOLVED.

J. Pow and G. Tomlinson, Salford, plasterers.—C. Marriott and J. H. Bradwell, Southwell, Nottinghamshire, land surveyors.—D. Davies and J. Evans, Swansea, ironmongers.—J. Goodger and W. Trevelion, Moor-lane, Cripplegate, carpenters.—J. Wild and E. Wild, Ramsbottom, near Manchester, joiners.—J. Sims and W. K. Duxbury, Leeds, brick makers.—S. C. A. and J. Bonsey, Chertsey, brick makers.—Jackson and White, Threlkeld, Cumberland, brick and tile manufacturers.—Tindall and Shippin, Hunslet, near Leeds, bricklayers.

THE BUILDING NEWS.

LONDON, FRIDAY, NOV. 10, 1871.

LONDON INTERNATIONAL EXHIBITION FOR 1872.

ON Tuesday last a meeting of the General Purposes Committee appointed by her Majesty's Commissioners for the Exhibition of 1851, met and prepared the following

RULES FOR SUPPLEMENTARY SPACE IN THE ANNEXE FOR BRITISH EXHIBITORS.

For the convenience of visitors to the Exhibition and in order to facilitate the knowledge and circulation of new objects selected for their excellence, Her Majesty's Commissioners have decided that exhibitors of British manufactures shall, in addition to the space afforded by the Exhibition proper, have supplementary space in the Annexe allotted to them for purposes of sale. The exhibitors will not be charged a rental for such space.

The following are the rules, in conformity with which the sale and removal of objects will be allowed:—

1. Exhibitors whose works have been admitted to the Exhibition proper by the Committee of Selection will be awarded further space where they may display objects belonging to the undermentioned classes chosen for the year 1872, provided that such objects are duplicates of those displayed as manufactures in the Exhibition proper or correspond as nearly as possible with them.

Class 8.—Cotton and cotton fabrics.

Class 9.—Jewellery, *i.e.*, manufactured articles worn as personal ornament made of precious and other metals, precious stones, or their imitations, jet, mother of pearl, steel, iron, &c., but not goldsmiths' and silversmiths' manufactured work of other sorts, which it is intended shall be exhibited in 1876. It is intended that ornamental watches shall be exhibited in 1875, with other horological manufactures. (Fine art in precious metals will be admitted with Fine Arts.)

Class 10.—Musical instruments of all kinds.

Class 11.—Acoustic apparatus.

Class 12.—Paper, stationery, and printing.

Division III.—Products of inventions and discoveries, admitted to the Exhibition proper, capable of being exhibited in a very small compass.

2. As soon as exhibitors have been admitted to the Exhibition proper, and at latest before the 10th of April, 1872, they must submit a catalogue of the objects for which they desire supplementary space in the Annexe, and the prices must be given of each object they desire to supply to the public.

3. Space will be assigned in the Annexe, by official committees, to the various exhibitors, according to the importance of their collections in the Exhibition proper and the space available, which will be very restricted in amount.

4. Exhibitors having supplementary space in the Annexe granted to them will be permitted to fit up their own cases, subject to the approval of Her Majesty's Commissioners, who will prescribe the system of lettering and the form of large notices.

5. The objects sold on each day cannot be removed from the building until after the close of the day's Exhibition, at 6 p.m., and after duplicates have been substituted.

6. The catalogue of each supplementary collection, with prices, must be printed by the exhibitor in accordance with the rules which shall be laid down. During the Exhibition no change could be made by him in the nature of the objects displayed or in the prices stated.

On the evening of the same day (Tuesday) a large and enthusiastic meeting of tradesmen, including some of the largest in London, was held in Willis's Rooms to condemn the whole scheme as arranged by the Commissioners. There was not a dissentient voice at the meeting—in fact, it scarcely looked like a tradesmen's meeting, as it had more the appearance of a political gathering, where men give utterance to strong opinions in strong language. The Commissioners and a large portion of the British public, and that portion no unimportant one, are therefore in direct antagonism; and it is next to impossible for any international exhibition to take place next year, without intermediate ground is taken, exasperated feelings allayed, and a mutual understanding be arrived at. What is the cause of this misunderstanding? Because the Commissioners, or somebody usurping their authority, have acted unfairly, clandestinely, and contrary to the spirit and intention of the International Exhibition of 1851. On June 23 last, Mr.

A. J. Copeland wrote to Mr. Cole saying that whilst traversing the annexe of the International Exhibition, he noticed it was more like a bazaar than an Exhibition, as attendants were there quoting prices, selling things, receiving money, &c., and he wanted to know whether such was in accordance with the rules laid down by the Commissioners. After several days had elapsed, Col. Scott answered Mr. Copeland, and said the privilege of erecting supplementary galleries was granted to foreign governments in consequence of applications for additional space, and that similar privileges might be enjoyed by British exhibitors. It should be borne in mind that it was in these annexes or "supplementary galleries" where the things were sold; and as two months had passed since the exhibition had opened, it was not very fair to the British exhibitors to tell them that they might enjoy the same privileges as foreigners. There can be no doubt that British exhibitors were subject to a manifest disadvantage at the Exhibition this year. In fact, it was quite notorious that a very large number of articles were there and then sold by the French exhibitors. One speaker, quoting an official return, said that the French alone sold £20,000 worth of goods, and took orders for £40,000 worth more. Now, supposing that British exhibitors, from the first, had extended to them a similar privilege, which they had not, a retrograde step would have been taken; and the rules, as laid down for the Exhibition next year, will be a still further departure from the principle which pre-eminently characterised the Exhibition of 1851. The Exhibition for next year, as above outlined by the General Purposes Committee, will, if carried into effect, be nothing more nor less than a gigantic bazaar, as was the one this year in a less extended degree. International exhibitions for the promotion of art and the development of a wholesome rivalry between the manufacturers of different countries are one thing; but exhibitions for the individual benefit of certain manufacturers, where they may sell their goods and extend their connection, are very different things. The former class of exhibition a government may with propriety promote; but it is impossible for governments to promote gigantic bazaars without doing gross injustice to the taxpaying community in general, and to the manufacturers and tradesmen who are not represented at such bazaars in particular.

The meeting of tradesmen at Willis's Rooms on Tuesday evening was all very well as far as it went, but it savoured rather too much of the *English* shopkeeper to commend itself to general sympathy. The great grievance in the estimation of several speakers was that certain *French* manufacturers reaped certain advantages, and that it was done in contravention of certain defined stipulations. Great stress was laid upon the fact that the foreigner was a privileged person at the Exhibition. We think that the speakers might with advantage have taken wider and safer ground, and at the same time based themselves on a principle. £20,000 or £60,000 is a mere bagatelle compared to the injury entailed by a wrong course of action taken by the Commissioners who were legalised by Parliamentary action, and are therefore ultimately under Parliamentary control. If it were a merely *British* Exhibition it would have been wrong for the exhibitors to be permitted to make it into a bazaar, because by so doing they would be inflicting an injustice on non-exhibitors. There can be no doubt that an exhibitor at South Kensington enjoys a certain privilege. The building being in contiguity with the Horticultural Gardens with their attractions, and the Albert Hall with its music, thousands are attracted thither who would not otherwise go. The appliances of South Kensington Museum and the Society of Arts are put in motion, and the weight

and influence of Royalty are made subservient to these International Exhibitions. An exhibitor, therefore, has, in a sense, the nation advertising him gratuitously, and if he is permitted to exhibit his goods in one department of the Exhibition and sell duplicates of them in another department, he enjoys a privilege which his brother tradesmen, who are not exhibitors, have assisted to create. It would be contrary to good taste, opposed to justice, and certainly to good government, for any section of citizens to enjoy such privileges; and it assumes a still less attractive aspect when Frenchmen or any other foreigners enjoy such privileges at the expense of Englishmen as they did this year.

But, independent of any privilege enjoyed by any one, it is ill-advised, to say the least of it, to turn an International Exhibition, which must be fostered by Government, into a bazaar. It degrades our idea of International Exhibitions, and if they cannot be held without the shop element being so conspicuously developed, it is better they should not be held at all. Judging from the spirit evoked at the meeting at Willis's Rooms, it is not likely that the Commissioners, or those who acted in their name, will be permitted to repeat the error. A deputation was appointed to wait on the Commissioners. Let us hope that the deputation will not be satisfied by seeing Mr. Cole, or the General Purposes Committee, who are, no doubt, answerable for the grievous mistake already committed. Let them go to the fountain-head, to such men as Mr. Gladstone and Lord Derby, and boldly state their case, and let them by no means be introduced by Mr. Chambers, M.P., the chairman of the meeting, who made so many mistakes in his opening speech. He not only spoke of the South Kensington Museum as if it was supported by voluntary contributions like a hospital, instead of being supported by national money, as he, as a Member of Parliament, should have known, but he thought the South Kensington Museum authorities responsible for the error and the wrong complained of, when in reality another body of men, the Commissioners appointed in 1851 and reappointed since, are alone responsible. Mr. Chambers also gave the wrong keynote to the meeting. He regarded it as purely a matter affecting the trading interests of a few Frenchmen and a few Englishmen, whereas it is a much broader and deeper question. It is a question affecting the vitality of International Exhibitions, and the province of Government in relation to these Exhibitions. A retrograde step having been taken, let us hope that wiser counsels will prevail in future, and that the International Exhibition of 1851, which was beneficent in its origin and its results, will not be tarnished by unworthy, intermeddling, and incapable hands.

NOTES ON BRICKWORK.—II.

THERE is another process of reducing clay that contains much stone to a state in which it can be moulded into bricks. Where the clay contains even a few stones, it is sufficiently laborious to pick them out by hand. When it contains many, they are got rid of by dissolving the clay into a pulp that will run off and leave the stones behind. This pulp contains a good deal of sand—generally so much as to render the substance too short and friable for making strong bricks. The want is supplied by grinding up chalk and mixing it with the clay, which has the effect of binding the mass together and preventing the fusion of the brick which would take place in the burning without it. The mixture of clay, sand, and chalk is called malm.

To burn bricks in kilns is more expensive than to burn them in clamps, but to burn them well in clamps it is necessary to mix the fuel more intimately with the clay than is practicable in the ordinary process of temper-

ing. When the clay, however, is washed, as just described, to free it from stones, the opportunity presents itself to perform this operation of mixing the fuel intimately with the clay, and after a sufficient depth of malm has been run into the pit, a layer of breeze, which is sifted house-ashes, is spread over it (after it has stood long enough to be tolerably dry), and the two substances are turned over together and incorporated, after which the clay is passed through a pug-mill to complete the process more thoroughly. Thus prepared, the bricks can be packed close in the clamp, and will burn without open spaces being left between them. This manner of making bricks is an expensive one, and of the bricks made altogether of malm the best are reserved for cutting to arches and gauged work, and for the best description of brickwork. Their colour is yellow. The second quality of bricks of this sort are used for the fronts of buildings of a superior class. There is a kind of building brick called pavours, which are hard, sound, square, and of good colour. Washed stocks are used for ordinary brickwork, and are the least valuable of those bricks made altogether of malm. Bricks made of unwashed clay, with more or less malm added, are called gray stocks, and are good bricks. Rough stocks are rough in shape and colour, and do not make good face work, although they are hard and sound. Grizzles are the outside bricks of a clamp, on the windward side, and, not being thoroughly burnt, are tender, and should be used only for inside work. Place bricks are those which are left in the clamp after the better bricks have been selected, and are those which are not uniformly burnt. They should be used only for the commonest work. Sometimes the sifted ashes are mixed with the clay in the process of digging, a layer being spread over each layer of the solid clay as it is turned over. We decline to give space to a description of some of the ways of making and burning rubbish, which we have seen, and which, when burnt, are called bricks, but are altogether unworthy of the name.

In making bricks there are certain processes common to every system, and others applicable to particular systems. The first thing to be done always is to dig the clay in the autumn, and let the winter's frosts act upon the loosely and openly-lying clay, so as to reduce its stubbornness. Clay, in its natural state, absorbs and holds tenaciously a large quantity of water, and when it is frozen it expands and disrupts the mass, swelling it to a larger mass. By this means the air penetrates it when the ice thaws, and it falls and mellow into a congenial mass for future handling. One winter's frost may not do all that is necessary to fit it for the moulder, but it will do a great deal towards it, and that which is required to complete the process of tempering is to be done in the early spring by turning it over again and again, each time throwing out the extraneous and objectionable matter, until it has been thoroughly tempered. The notes we have at hand on this process in one of the north midland counties (Yorkshire) are as follow. Commence digging clay about the beginning of November; generally finish digging in January. The clay is then turned over once, and lies until about April, when it is again turned over, for common bricks twice, and for bastard stocks three times; it is then ready for the moulder. Time of moulding, from April to August inclusive. A quantity of clay of the dimensions of 10ft. \times 7ft. \times 1ft. dug out of the solid makes a thousand bricks. The clamp contains 100,000 bricks, and burns in three weeks. When burnt there is 1 in 100 waste. The common bricks are slop-moulded; the bastard-stocks are sand-moulded, the clay being rolled in dry sand before it is thrown into the mould.

It is necessary to distinguish between the common bricks of commerce and the old legal term of "common brick." The former are of a common sort, and usually burnt in clamps, although no fuel is mixed with the

clay before it is moulded, as in the case of malm bricks; but in the latter case a common brick was any brick used for ordinary building, to distinguish it from a drain brick, or a brick made in a mould larger than the dimensions of 10 \times 5 \times 3. These dimensions, by the bye, were by a subsequent Act changed to a cubic measure of 150 cubic inches.

Clamp-burnt bricks, however, although great numbers have been used on railway works, are very inferior to those that are kiln-burnt, unless they are made after the manner of malms—i.e., with the fuel incorporated.

At another yard the bricks for the railway bridges were burnt in a kiln holding 30,000, for which 15 tons of coal were allowed. The prices paid per thousand bricks were:—

	s.	d.
For getting the clay.....	1	0
Tempering.....	1	6
Moulding	1	6
Wheeling	1	0
Carrying off	0	6
Walling up, or hacking	0	6
Wheeling into kiln	0	9
Burning	1	4
Drawing out	0	9
	8	10

Before the bricks are dry enough to be wheeled into the kiln they lose about a quarter of their weight by the evaporation of the water, and after they are burnt they are about two-thirds of the weight of the clay when turned out of the mould. The bricks are not fired immediately after being put into the kiln, but are dried by being lightly fired for the first two days.

In moulding bricks there are two methods, the wet or slop moulding, and the dry sand or pallet moulding. In the one method the tempered clay, which is filled into the mould by a forcible dash, so as to fill every angle of the mould, is made to slip out again easily by wetting the sides of the mould by plunging it into a water trough on the moulding table (or stool) before it is refilled, and in the other method by a sufficient quantity of sand being scattered over the sides of the mould; or, as in the practice just named, by rolling the lump of clay in sand, to facilitate the turning out of the green bricks upon the pallets, which are small boards upon which the bricks are wheeled away to the hack, the hack being a pile of green bricks set on edge with spaces between them to admit of their drying sufficiently to allow them to be removed to the kiln. Before being burnt the partly-dried bricks are dressed over to remove imperfections and to sharpen the arrises, and scraped to remove any dirt there may be.

The number of bricks that can be produced per week by each moulder and his assistants is much greater by the sand process than by the wet process, or slop moulding; and the labour is greater also. At the Blechingley tunnel, on the Dover Railway, Mr. F. W. Simms, the resident engineer, in order to test the relative economy of the two processes, instituted a series of observations, from which he arrived at the conclusion that while the production of sand-stocks was in the ratio of 30 to 16 by slop moulding, the amount of labour was as 7 to 4, and that the land required and the cost of labour were the same in both cases. The method adopted was slop moulding, and one moulder, one temperer, one wheeler, one carrier boy, and one picker-up boy produced 16,100 bricks per week during a season of 22 weeks. The average quantity of coal used in burning was at the rate of 10 cwt. and 8lbs. per thousand of bricks.

Bricks are burnt either in a kiln or a clamp. A kiln is a permanent shell of brickwork with firing-holes in the lower part of the walls, and from these flues are constructed of the bricks to be burnt, and the bricks

are arranged with spaces between them so that the heat may be conveyed round each separate brick. This arrangement, it will be seen, is necessary when no fuel is incorporated with the clay of which the bricks are made. In clamps the bricks are set closer together, and when the fuel upon which depends their proper burning is incorporated with the clay, as in the case of malm and stock bricks, they become thoroughly burnt, but in the ordinary method of brick-making only inferior sorts can be burnt in clamps.

The apparent characteristics of good bricks are that when two are taken in the hands and struck together, they give out a clear ringing sound. When broken they show a compact uniform structure, hard and somewhat glassy. Those bricks which absorb the least quantity of water after being soaked for 24 hours are the best.

The Staffordshire blue bricks are very hard, sound, and heavy. They are burnt in ovens, and the blue colour is produced by burning them for a longer time, and to a greater degree of heat, than red bricks require. It is the peculiarity of this clay, or more properly marl, that it will stand burning to a greater degree than most other clays from which building bricks are made. A very good hard and durable paving brick is produced from the same clay, called dust brick, from coal dust being used in the moulding, of the size of 9 \times 4 $\frac{1}{2}$ \times 2. Other kinds of pavours of various dimensions are also produced, and moulded copings of various forms.

DILAPIDATIONS.—II.

LAY.

WE have now to consider the rights and liabilities of that large class of persons called lessees, and these will be found in the following tables. Tables 3 and 4 are respectively devoted to the consideration of the rights and liabilities of tenants-at-will, and tenants by elegit, statute merchant, or staple. The rights and liabilities of tenants in fee simple, tenants-in-tail, and tenants-in-tail after possibility of issue extinct, are comprised in Tables 5, 6, and 7.

TABLE 2.—RIGHTS AND LIABILITIES OF LESSEES.

1. Cannot compel landlord, or lessor, to repair, unless bound by contract to do so.
2. Cannot require premises to be rebuilt by lessor, although lessor may have insured the premises, and has received the amount from the insurance office.
3. Must pay rent though premises be burnt down, unless there is an express covenant that rent shall cease.
4. No implied condition that they may leave or quit, if landlord neglects to do the repairs which he is bound to do. (Note.—There must be an express stipulation to that effect to entitle them to do so.)
5. No implied covenant that if landlord omit to do the repairs, according to his covenant, they may do them, and deduct the amount from the rent.
6. Where there is an express agreement in writing for the hire of a house, and for keeping it in repair, there is also the implied obligation to use it in a tenant-like manner.
7. An implied contract to commit no waste.
8. Where no express contract or covenant as to repair, or no express exemption from liability to repair, then bound only to preserve premises from occasional and accidental dilapidations.
9. Cannot leave where lessor fails to keep his covenant to repair, although lessee may have repeatedly served him with written notices to do so. REMEDY by action on the covenant.
10. If a covenant to repair be general, then only liable to keep the premises in substantial repair (a literal performance is not required).
11. Even where premises were taken for a term of 3 $\frac{1}{4}$ years by written agreement, which was neither stamped nor signed by both parties, with the condition of keeping them in good repair during the occupation, it

was held, bound to repair *though agreement void*.

12. Where lease granted becomes inoperative from certain causes, *still* the liability to repair continues limited in its construction to such repairs as are consistent with a lease tenancy, holding over after lease expired.

13. Holding over after determination of lease, liable under the covenant in expired lease to keep premises in repair, and the decisions give it that even if premises are burnt down *after* the expiration of lease, still they are to be rebuilt as if lease had *not* expired.

14. Liable to repair (within convenient time) even if roof be stripped by the *wind*.

15. Not liable to rebuild if house be blown down by *tempest*, or destroyed by *flood*.

16. Not liable for breaches of covenant to repair, that may occur *before* execution of lease: although such breaches may happen *subsequent* to the day from which the term is to commence.

17. It is very important to remember in purchasing that, no matter what length of time may occur between the date of the contract and the completion of the purchase, still (title being good and made good), all dilapidations *from date of contract* fall on the purchaser.

18. Liable for pulling down houses, or suffering houses to be uncovered, whereby the rafters, or other timbers, become rotten. (Note.—This is termed "WASTE.")

19. Where covenant "as often as was necessary, well and sufficiently, to repair, uphold, sustain, paint, glaze, cleanse, and scour, and keep and leave the premises in such repair, reasonable wear and tear excepted."—HELD, that if repaired within a reasonable time before leaving, only bound, in addition to the repair of actual dilapidations, to clean the old paint, &c., and *not* to repaint.

20. Where covenant "to leave the premises at the end of the term sufficiently maintained, repaired, paved, and fenced," if pavement out of repair, and glass broken, this covenant is *broken*.

21. Odd as it may appear, it is yet correct that the covenant "to paint at the end of five years" is not a continuing covenant.

22. Bound to *paint inside* where the covenant in the lease of a house is "should and would substantially repair, uphold, and maintain." *Monk v. Noyes, 1 Car. and P., 265.**

23. Must rebuild if house be burnt by accidental fire.†

24. Cannot be compelled to make good such dilapidations as accrue from the natural operations of time and the elements, when the premises were old at the time of *granting* lease.

25. Must put premises into repair if necessary, where the lease of old premises contains covenant to keep in repair; and must leave them in repair at end of the term, *because* they cannot be kept or left in repair in accordance with the covenant, unless this is done.

The next table relates to tenants-at-will, who are those who hold merely at the will of some one else, and whose tenancy therefore may be determined without any notice at any time. I may remark that this class of tenancy is almost out of date, as directly rent is paid at fixed periods for certain lengths of time, the tenancy merges from tenancy-at-will, to yearly tenancy, monthly tenancy, or such tenancy, as the payment represents.

* I quote this case because so many hold that inside painting is decorative, and that as long as no damage to the wood can be shown, no internal painting can be maintained.

† This liability comes under the general covenant to repair. A peculiar case in support of this is worth citing. I quote from "Grady." The case is "Gregg v. Coates." A testator directed his trustees to allow B. to occupy a mill as long as he should think proper to do so, keeping the premises in good and tenantable repair, and paying a certain rent. B. took possession, and the premises were destroyed by fire. Held that B. was bound to reinstate them, and was liable for the rent in the meantime, and that he could not escape from his liability to rebuild by declining any longer to retain them.

TABLE 3.—RIGHTS AND LIABILITIES OF TENANTS-AT-WILL.

1. Not liable for dilapidations.
2. Liable only for *wilful* waste.
3. Not liable even where house burnt down by reason of negligently keeping the fire.
4. Not liable where house falls down, for the reason that he is not bound to repair.
5. No liability *except* to pay rent and occupy.

TABLE 4.—RIGHTS AND LIABILITIES OF TENANTS BY ELEGIT, STATUTE MERCHANT, OR STAPLE.

1. Not bound to do any repairs.
2. Liable, it appears, for cutting timber, &c. (called committing waste).

TABLE 5.—RIGHTS AND LIABILITIES OF TENANTS IN FEE SIMPLE.

1. Not liable for repairs.
- Note.—Not responsible to any one for the manner in which he uses or treats the estate, and the party to whom he devises it *takes it with all its defects*.

TABLE 6.—RIGHTS AND LIABILITIES OF TENANTS-IN-TAIL.

1. Not liable for repairs, exactly the same as tenants in fee simple, while possibility of issue exists.

NOTE.—The reason of this would appear to be that the right of the remainder man is so remote and uncertain, that its value is not affected by dilapidations or alterations of the tenements.

TABLE 7.—LIABILITY OF TENANTS-IN-TAIL AFTER POSSIBILITY OF ISSUE EXTINGUISHED.

1. Are liable for destruction of the premises.

I purpose next giving the remaining tables of rights and liabilities; and also considering the meaning of the various covenants, and their construction by the authorities.

B. F.

THEORY OF THE ARTS.

ARCHITECTURAL COMPOSITION.—IRONWORK.

(Continued from page 324.)

IRON, as a constructive material, has been developed to such an extent that architects, however averse they may have been to its employment at the first, are beginning to use it as a material more durable and often more economical than wood. The antipathy architects naturally entertained towards iron doubtless arose from the masonic ideas of form and proportion which their education had given them, and the historical examples their art had placed before them. We now live in an "iron" age—its manufacture is the most important we have, and its influence on our civilisation and art cannot be over-estimated. Architects are therefore bound, as the professed devisors and adapters of material, to make use of an agent or vehicle which has so largely entered into our wants, industries, and manufactures as to have demanded recognition on the score of its usefulness alone. We will dwell on its æsthetic capabilities by-and-by, and here consider it under the two aspects which fundamentally determine its artistic expression—namely, physically and mechanically.

The atmospheric effects on iron are of a more subtle nature than those to which stone or wood is liable. There is an electrical condition or action superinduced, and the metallic bases are more predisposed to combine with different gases than the earthy bases. The conditions most favourable to the protection of iron have hardly been sufficiently investigated to establish any positive rules for the guidance of practical men. There are, however, some states of the air in which iron unprotected by any artificial covering will last a considerable time. Water or moisture and the air are the two most powerful agents of disintegration. If iron be exposed in confined positions, and in dry atmospheres, the oxidation which ensues will, it is found, protect the

metal beneath. Damp situations and confined air produce, on the other hand, a serious effect, and it is asserted by M. Vicat, that this destruction is accelerated by the presence of carbonic acid gas, under which influence iron enters into the state of the carbonate of protoxide, and ultimately into a hydrated peroxide.* Hence the same authority says iron imbedded in fresh lime or concrete is protected from injury, the carbonic acid entering into combination with, or being absorbed by the mortar for which that gas has an affinity, or at least the lime in it. The preservative action of the lime, however, ceases to protect the metal directly its induration is completed. The great object seems to be to prevent quick or thorough oxidation, which takes place more actively in iron that is used in undisturbed positions, as in buildings, than when frequently disturbed, or subject to movement, as in anchors, the plates of vessels, &c. Alternations of exposure to air and sea water, ammoniacal and sulphuric acid gas, act very seriously upon both cast and wrought iron, and its use for roofs of gasworks, engine sheds, &c., is therefore doubtful. The protection of iron by coverings of gas tar, and other compositions of lead, oils, &c., or the galvanisation of iron, are processes that are highly necessary and beneficial when the metal is properly covered.

The contact of iron with other metals seems to excite a kind of electric or galvanic action, especially through the agency of moisture, which action contributes much to their decay. Thus, iron let into lead has shown rapid decay, while the unequal manner in which metals in contact are affected often tend to render their combination unsatisfactory. Zinc has a very limited durability in some atmospheres—sea air and smoke seem to affect it injuriously, while lead undergoes little change.

Mechanically and constructionally iron may be regarded to hold a similar position to wood. The remarks regarding the latter material apply in a great extent to iron. Lately, the constructive adaptation of this material in extensive works requiring lightness and rigidity has placed it in rivalry with wood. The combination of the two materials has vastly assisted the constructor to economise material, and give to the different parts of his structure the strength and security of iron. Thus, in trussing and roofing, especially, the advantages of iron in superseding the use of wood for pieces subject to tensile strain, such as king-posts, tie-rods, &c., are manifest and convincing. Used in conjunction with timber, however, in systems of framing which are exposed to sight, architects have not without reason shown an antipathy to its use from the fact of its harmonising so unhappily with wood. The attenuated proportion of iron relatively to this last has rendered its co-operation æsthetically antagonistic. But really this is a prejudice arising, I think, from education and association more than any intrinsic principle of beauty, and will ultimately cease when the proximate principles of construction and the relative values of materials are better understood in the economy of architecture. Even now architects entertain much less objection to iron in their designs than they did a few years ago, while attempts to reconcile it as an artistic material are being made every day. In these days, too, the architect or engineer has to consult strength or practical efficiency in his work, not altogether the size or weight of material; the maximum result at the smallest cost or expenditure is the test of success in architecture as in every other work. Mechanically, the same principles that determine timber framing apply to iron construction, and it is the proper combination and reaction of the compressive and tensile strains that has to be considered in design.

* See valuable article by the late Geo. R. Burnell, read at the Royal Institute of British Architects, 1854.

Taking in exemplification of this view one class of manufacture, namely, iron beams or girders, it is surprising what this material has done for constructive purposes. In treating of timber we have noticed the strength or ratio of stiffness to dimensions, without regarding defects, such as knots, &c. Cast iron is, perhaps, open to a similar objection: it cannot always be depended on in cases where transverse strength is required, the unequal contraction in cooling, air-holes, &c., and its extreme brittleness, rendering it liable to fracture under certain treatment.

The well-known formula $W = \frac{a d C}{l}$ where

W = weight, a = area of lower flange, d = depth of girder, l = length, and C a constant whose value is determined by experiment, and depending on the form of girder, has stood practical test, and enables us to compare the relative strengths of wood and iron beams, which is found approximately as 1 to 2. As heavier size is necessitated by the use of cast iron, wrought iron or plate girders of various forms have greatly superseded it. Cast iron was first adopted in building at the beginning of the present century by Boulton & Watt, and subsequently Hodgkinson, Fairbairn, and Tredgold improved upon the form by various experiments, till the form or section in which the bottom flange is made larger than the upper was considered the section of greatest strength, and Mr. Fairbairn thinks this shape capable of being applied to spans as great as 40 feet. Truss girders gradually arose out of a more scientific use of the material and the exigencies of construction.

Confining our attention to plate girders, there are two types, the "box" and "web" girder, both excellent for different uses, though the single web girder is that which the experiments of Mr. Fairbairn have most favoured. The proportions to be given to the upper and lower flanges is a most essential point, though one on which opinions vary, many authorities thinking an equal sectional area of metal preferable; but from the almost general fracture of the lower flange when broken, the lower flange seems to require the greatest section. It must be recollected that cast iron possesses great power of resistance to compression, and wrought iron to extension, and that by a combination of the two sorts of iron an economy of material may be effected. Comparatively, however, the saving of wrought iron over cast iron for beams is evident, for on the supposition that both kinds are of the same cost, there is a considerable reduction in the weight of wrought iron that must commend it at once, besides its greater security and cost of fixing. Riveted-plate girders are generally giving place to "rolled" or solid flange girders, as a preferable and simpler kind of beam, which, if the process of manufacture can be relied on, must give them a decided preference to riveted plates or cast beams. From the homogeneous nature of the web and flanges, both members act simultaneously in resisting the compressive and tensile forces which such a girder is exposed to in the two opposite sides of its neutral axis when loaded. The labour of rolling, however, precludes the manufacture of great depths or sections, the metal being also less fibrous and sound in large masses. Where a long bearing or great depth is required, two or more small sections can be combined or riveted together, either on one another or secured sideways by flange plates, as adopted and patented by Messrs. Phillips, whose rolled beams possess all the advantages of plate girders. The latter form may be adopted in cases where depth is valuable and great weight has to be carried. The knowledge of the properties of rolled beams has, till quite recently, been somewhat vague. Experiments have placed the manner of fracture or breaking of girders on a reliable basis. They have generally been found to yield laterally, or to cripple before their full resistance is obtained, and that if such

girders were prevented from this twisting a much heavier load could be sustained. By riveting a plate on the top or bottom flanges lateral strength is greatly increased; but the strength obtained in this sort of girder is chiefly owing to the web being integrally united (not with rivets) to the flanges, thereby contributing to the work of resistance. It is found that while an ordinary riveted web-plate girder gives a "constant" of 60, the rolled beam gives one from 75 to 80, which is about the same as that of a box girder: the experiment conducted to test the strength of the Phillips girder gave even a greater result than this when compared with a riveted one of corresponding sectional area, or as 75 to 300. The lattice girder is an economical adaptation of metal, and is a valuable form where great spans are necessary, and lightness of appearance has to be studied, as in bridge and roof construction. Trussed girders, combining rigidity with lightness, may also admit of much elegance in design if the spaces formed by the ties and brace were treated somewhat ornamentally or disposed in geometrical forms, the intersections relieved by bosses. A kind of arched open girder for roofing, &c., is being developed, and may ultimately effect a revolution in our decorative roofs, the spandrels being filled either with cast or malleable iron ornamentation, which at the same time could be made to contribute to the strength by preventing dislocation of the upper and lower posts or ribs. Some good examples of this kind of iron construction may be noticed in London and elsewhere.

G. H. G.

(To be continued.)

PEDESTALS.

By THOMAS MORRIS.

(Continued from page 324.)

FROM triumphal bridges the transition is natural to triumphal columns; and in works of the kind our inspiration comes from Rome. There, at the foot of the Quirinal Hill, was seated the Forum of Trajan, built by Apollodorus, a Greek architect, and the most magnificent of its kind. It included the temple, the basilica, and Ulpian library. It was crowded with statues of gods and heroes, great and learned men, in marble, bronze, and ivory. But the most elaborate and enduring feature was the Emperor's historical column. Its lasting quality is due to the marvellous nature of its construction. The pedestal consists of seven, and the column of nineteen blocks of white marble, each the whole diameter, and about five feet thick. The stairs for ascending to the summit are cut out of the solid blocks. By what methods these masses, weighing at least thirty tons, were hoisted and set can only be conjectured; but having been once deposited, it seems no mystery that they never came down again. The capital is in a single block 14ft. square and 5ft. high, so that the weight must be double that I have assigned to the courses of the shaft. The order is Doric, but the attributes are only displayed at the base, which has a bold enriched torus, and at the top, where the shaft is fluted and the egg-and-tongue enrichment finely carved. The surface of the shaft is charged with a band of sculpture, winding in twenty-two revolutions from base to necking. An immense field of antiquities is presented, where the Emperor appears in a hundred different points, as sovereign, general, or priest. No monument gives the complete and real costume so correctly. It exhibits without embellishment all the tactics of that age, and forms a grand commentary on Vegetius and Frontinus.

Such is the learned observation of Joseph Forsyth, whose "Remarks upon Italian Antiquities" are widely known, but whose personal history has not obtained a place in ordinary biographical works; and a few words may

therefore be acceptable to those who have not the memoir attached to the later editions of his work.

He affords a striking exemplification of the educational system that has long distinguished North Britain, but which is only now obtaining tardy recognition in the South. It is principally marked by the economy of childish years. Forsyth was born at Elgin, February 18, 1763, and at the age of sixteen had completed the ordinary four years' university course at King's College, Aberdeen. He came to London, was assistant at a boarding-school at Newington-butts, succeeded to the proprietorship, and retired in the spring of 1801, with competent means and a tendency to pulmonic infirmity. The peace of Amiens laid the Continent open in the autumn, and Forsyth was at Nice on Christmas Day. He embarked for Leghorn in the following January, and pursued his travels without interruption until May 25, 1803, when he was arrested as a British subject at Turin, and conveyed to Nismes. He escaped to Marseilles, but was recaptured in the act of entering an American vessel, taken back to Nismes, and punished by a march in mid-winter to Bitche. This was an unfortunate event, but in other respects his detention was free from rigour. He admits, indeed, that it was ultimately as agreeable as the fact of constraint at all allowed.

As a mark of patronage to men of letters, Napoleon I. had released certain *détenus* who appeared as authors, and Forsyth caused the notes of his tour to be published in England, and distributed wherever likely to be serviceable, with solicitations for his liberation. The MS. was probably dispatched from Valenciennes (June 1, 1812), where he says, "I am now passing the tenth year of my captivity." The effort was unavailing, and he regretted for the rest of his life that it had been made. The spring of 1814 brought his delivery, and he returned to England in May. He resided alternately at Elgin and in London, where he took advantage of the library of the British Museum for revising and perfecting his work. He died September 17th, 1815, and his "Remarks" were issued in a handsome octavo volume by Mr. John Murray, the following year. A third edition appeared at Geneva in 1824. In erudition, dashing assertion, error, and absolutism, he is not without eminent modern parallel; but I concern myself with his architectural opinions alone, and receive them with the qualified deference due to a critic whose acquaintance with the subject but served to convince him that architecture is not a fine art! He cannot, I think, have studied aright who denies to architecture the power of reading the affections, or who fails to distinguish between scientific propriety, a virtue though it be, and art which clothes that virtue with beauty, and gives it expression, light, and life.

During Forsyth's involuntary residence in France, Napoleon had possession of Rome, and was actuated by the keenest interest in all the records of the Cæsars. He caused the central part of the modern Piazza Trajana to be excavated to a depth of 15ft., and the pavement of the Forum laid bare. The floor of the basilica (180ft. by 170ft.) is nearly all visible, and it seems to have been the rule to make the thickness 4in. where exposed to the weather, and 1½in. where covered. The black Oriental columns have been arranged in lines, and some fine architectural fragments are piled upon the walls by which the excavation is enclosed.

The pedestal of the grand column consisted of a moulded plinth, a die covered with sculptured trophies, and a cornice charged with a festoon on each side, supported by eagles at the angles. On one side was the entrance to the stairs, and over it a dedicatory inscription. A plaster copy of the lower part of the shaft was, until lately, exhibited at South Kensington, showing several revolutions of the band of *relievi*, the

height of the band being about 4ft. That has now been removed to the crypt beneath, and is expected to emerge in one of the galleries at present in course of completion. The grand height of these buildings being sufficient to admit the pedestal as well as the frustrum of the shaft, it is probable that *squeezes* will be obtained in Rome, and the public familiarised with this remarkable relic.

The column erected in Carlton-gardens, to the late Duke of York, is an outline copy of Trajan's, filled up with granite. It shows the general form and proportions, but is utterly devoid of the graphic eloquence by which the original is so highly distinguished. There is no enrichment or accessorial decoration whatever. Not a word or sign connects it any way with the figure it sustains.

The mute and barren nature of the English work is made conspicuous by the column at Paris. There the same outline is adopted, with all the original profusion of embellishment. Modern costume, implements, and arms are substituted for the old. The wars of France in the nineteenth century replace those of Rome in the second, and history is written in bronze instead of marble. The attributes of empire are transferred from the Tiber to the Seine, and here we see the bulletin and crest. If, therefore, any one monument of national power could have been thought more dear to the pride of Frenchmen than another, it was pre-eminently the column of Napoleon I.

Fine Arts.

THE LOAN COLLECTION OF WATER-COLOURS IN
PALL-MALL.—SECOND NOTICE.

IT did not need any other inducement than its own excellence to draw lovers of the beautiful to the collection of water-colour drawings now to be seen at the Old Water-Colour Society's Rooms in Pall-Mall, though, doubtless, many will like the pictures none the less for knowing that their presence is assisting a valuable institution much in want of support. We have seldom seen so many really fine drawings collected together, and with so small an admixture of what is either commonplace or bad. Almost all the pictures are above the average of the works of their respective masters. Perhaps the most interesting point of all is the opportunity offered of comparing several artists, each masters of their art in a way, and of seeing how, through totally different modes of treatment, they after all arrive at much the same point. The broad rapid touch of David Cox, the rich manly vigour of De Wint, the graceful and delicate, the accurate and yet free finish of Birket Foster, all charm us by their absolute truth to Nature. What the one can do with a stroke or two of the brush the other effects by his marvellous delicacy of hand, and the other by his manly vigour and power of colour. There is not a stroke in any of these three that one would wish to have altered. None of them could have improved their work by borrowing from the other. They are all original in their handling and conception; hence the great estimation in which they are justly held. It is rarely, indeed, that so excellent an opportunity offers of comparing so many beautiful and characteristic examples of such eminent artists. On a former occasion we expressed our opinion of the mistaken habit, which is getting so prevalent, of using body colour in excess for the sake, usually, either of saving trouble or of imitating oil painting. We see no reason from the present exhibition, notwithstanding the celebrated artists who use it extensively, to alter our opinion. Most of the very finest things in the whole collection are purely water-colours, and the older members of the society prove that nothing more is required to get any effect that can be

required. There is nothing finer than some of Copley Fielding's drawings done in pure transparent colour.

As some of the artists will be more appreciated by this exhibition of their works in various styles, so we can scarcely doubt some will suffer—none so much as G. Cattermole. That he had a considerable versatility of talent, and a great power in the drawing of detail, especially of armour, some of which is not much inferior to what David Teniers could do, there is no denying; but when we see a large number of his drawings together, as in the present exhibition, we can scarcely account for the popularity of his works, which appear to lack almost all the qualities of really fine painting. Some are simply ludicrous, except in the one point of his great facility of giving minute detail of armour and costume. There is not one single instance in the whole collection where this artist has risen a single degree above the ordinary effect of the stage when he has attempted to depict historical or theatrical subjects. At some we could not suppress a laugh. In still life and in delineation of ordinary but jovial country life, none can come near our old favourite W. Hunt, whose works are very well illustrated in the present collection, though we think, perhaps, that a little trouble might have got together finer specimens of his figure subjects. Still, we must not complain, for what we have here is quite delightful. We might have had more important and better-preserved examples, but none more characteristic of the powers of the great artist. In the highest branch of the art, that of faithfully portraying the human figure, we have some especially fine things, the best of which are by Carl and Louis Haag and J. F. Lewis—the latter, however, being extraordinarily unequal. Nothing can surpass the beauty and truth of his Eastern scenes, and their exquisite detail; but in his representation of Italian life he is far from successful. It is hard to conceive that the man who was so great in the one should be so poor and tame in the other. There is one other thought which presses upon one throughout the exhibition, and that is how strangely below the best work of each artist is every single example to which the word "composition" is attached in the catalogue, gorgeous in colour and skilful in painting though some of them are.

Amongst the drawings of the human figure the foremost are Carl Haag's "Tyrolean Peasants" (67), a picture which one would have thought, in size and magnificence of colouring, to have been beyond the reach of water colour. By this artist there are many excellent examples, those illustrating desert life being probably the most popular—Nos. 35 and 79, the latter being a smaller representation of the happy family in the desert. The dying glow of the sun from the one side and the silver moon rising, are skilfully managed; all the detail is astonishingly perfect and free. Without the minute elaboration of J. F. Lewis, the effect is equally good. The life of the laughing mother as she dances up her comical little dark baby contrasts prettily with the quiet, patient camel and his master, soothing his sandy walk with his pipe.

Louis Haag is equally successful in his fine drawing of the "Death of Zurbarau," No. 88, in every way a grand performance. The painter has just quietly passed away, the piece of black chalk still in his fingers, with which he has drawn a beautiful outline of the head of his Lord crowned with thorns. Just as in most of G. Cattermole's compositions scarcely a figure is at all natural, either in expression or attitude, so in this there is not one that might not have been there and doing just what they are. This artist also has several other capital drawings. The "Guard Room" (No. 112) in finish and power is as good as that just noticed. By F. Goodall are two or three pretty bits; No. 101, "A Coffee Bearer," and No. 131, "Feeding the Swans," both good, but not giving an

adequate idea of his great powers. There are also good examples of F. W. Burton, in whose powerful portrait, "The Marchesa," there is some excellent painting, though it strikes us as rather hard. The jewellery is excellently done. But of all the paintings executed by this artist we like the sweet little bit entitled the "Virgin's Day" (No. 174), which in its way is as good as anything in the rooms; and what is called "Iron-sides, A.D. 1660," but which might have better been called what it really is, "a portrait," and a very fine one, too, bearing comparison with Carl Haag's grand head of a Dalmatian peasant, No. 38. J. F. Lewis has specimens of Italian and Eastern life. Neither of the former, No. 25, "Murillo Painting in the Convent," and "Easter Day at Rome," No. 31, are altogether satisfactory. There is a flatness and mannerism of colour and drawing in each which detract much from their other great merits. In the latter, notwithstanding the immense crowd of incident, there is absence of movement and life. The drawing, too, seems weak in many parts; but when we turn to the Eastern ones, Nos. 177, 184, and 203, we have all we can want. The last, "A Halt in the Desert," is the most important, the marvellously-clear atmosphere bringing out the figures of the Arabs and their camels like sculpture. The other two are about equal in quality, and each shows an amazing quantity of detail. In the "Caged Doves, the light thrown upon the beautiful dress of the lady through the lovely lattice work is magic. The only scenes in which G. Cattermole is quite satisfactory, though in all there is much to admire, are his more sober subjects. "The Prior's Parlour" (No. 198) is a good specimen of the kind. In many ways excellent is "The Great Contest for the Bridge," which is full of life and fairly true to Nature; in it, too, the artist has shown great power in his grand woody landscape, done almost as broadly as David Cox's work, but with a heavier touch. The worst, because so hopelessly unnatural, though some of the armour is as good as Teniers', is No. 192, "The Death of the Earl of Warwick." J. Gilbert's "Battle of the Boyne," where William III. is leading his bay-crowned followers across the river, is a favourable and elaborate specimen of his facile style. "To the King's Aid" (No. 166), by the same, is also a capital representation of moving masses of armed men. F. Taylor has many good pictures which we have not space to particularise. G. Bach's "Psyche" strikes us as his most successful piece.

In landscape and architectural painting the exhibition is so rich that it would exceed our limits fully to describe the gems which abound. One of the very loveliest bits in the collection, and, in fact, one of the most beautiful things we have ever seen, is Copley Fielding's "Loch Lomond." It is entirely in transparent colour, and of the most delicate and highest quality. His "Rievaulx Abbey" (102) is magnificent. There are good and rich drawings by John Varley; but it is when we come to David Cox and De Wint that the collection surprises us. Most of the Cox's are in his later and most effective style. No. 19, "Bolsover Castle," is in his most finished manner, and 90, "The Deer Stalker," is his strongest. There are also two excellent interiors, and one charming little sea piece, most interesting as showing his power to hit off the effect of sea water in motion. De Wint's "Crossing the Ferry" (No. 227) shows solid effect without much work. 114, "Whitby," and 108, "Lincoln," are both as fine as possible. One of the most charming things we have ever seen is a landscape by Carl Haag, "Sunset, Hoher Gohl, Bavarian Tyrol." Birket Foster is represented in all his styles, and by very numerous examples. Two of the best are in the inner rooms, 209, "Arundel, by the river," soft and silvery in tone, and delightfully refined. No. 232, "Dolly's Walk," is one of his best pictures of village life, everything being carried out

in the most conscious and happy manner. In delineation of sea the foremost is E. Duncan, whose pictures are numerous, all worth study. We must not omit O. W. Brierley's "Armada off the Coast of Ireland" (No. 52). In conclusion we have only space to notice a pretty little Stanfield (13); two good specimens of D. Roberts, "Rouen" (No. 75) an excellent architectural drawing, interesting to compare with the three fine Prouts of similar subjects, which we think he surpasses, as being brighter, truer, and not so mannered.

Last, but by no means least, and standing quite alone, is a particularly fine series of the works of W. Hunt, to give an adequate description of which would take up the whole space we have at our disposal. Suffice it to say that he is represented in all his styles, fruit, flowers, and country boys, the young fisherman (No. 12) lovingly eyeing the tittlebat in a bottle, and the boy blowing bubbles (No. 147) being the most characteristic. We have never seen a more faultless delineation of flower and mossy bank than No. 146, "The Wild Orchis and Primrose." No. 124, melon, peach, and grapes, to say nothing of some red currants, also leaves nothing to be desired. In No. 99, an interior, we have a somewhat unusual instance of this master's genius. The fine Jacobean room, with all its belongings, literally stands before you. We have said enough to show that all art-lovers who have not yet seen this collection should lose no time in doing so, as it will well repay several visits. It will close shortly, and we trust the National Consumption Hospital will reap a good harvest from the receipts.

NEW BRITISH INSTITUTION GALLERY, OLD BOND-STREET.

This small but well-lighted gallery was established as an art-institution of the metropolis three seasons ago, by a little republic of artists, associated with a few of the literary and amateur element, professedly to fill up the void occasioned by the closing of the British Institution, and also to redress a system of injustice under which "outsiders" were supposed to suffer at the hands of the Academic body. The room, as we have said, is of moderate dimensions, perhaps slightly larger than Mr. Wallis's gallery (dignified as the French Gallery) in Pall-mall; and contemporaneously with its establishment another small gallery opened its doors a little higher up the street, called "the Old Bond-street Gallery," and intended to aid in the same purpose. Now, supposing the charges of wrongful exclusion and cruel hanging, so often and so persistently urged against the Royal monopolists, to be thoroughly well founded, and that the considerable body of independent artists, their victims, were earnest in purpose, it would be hard, we think, if the latter could not club together with two or three hundred contributions to cover the walls of these galleries, and to cover them with decently-executed works, calculated to do credit to themselves, and redound honour to the arts of the country. Failing this result, it would stand to reason that the oft-repeated complaints against the Royal Academy were either of doubtful validity in principle, or unimportant as to the extent of their application. Yet what do we find as the actual fact—as far, at least, as "the New British Institution" is concerned—the neighbouring gallery not having yet opened for the season? Of the hundred and eighty productions exhibited in this gallery on the present occasion, about one-third in number are importations from abroad, chiefly Belgium, and amongst that number are the majority of works one would care to look at; works which demand attention for technic merit at least, if of no grand pretensions in other respects. A circular issued by the "Honorary Secretary," dated in the current month, refers to the success which attended

the contributions of a few foreign artists to the last spring exhibition, and adds that, as a consequence, "the Committee have renewed and extended their invitations to foreign artists." What, we ask again, does all this imply, if not that this particular exhibition venture, depending as it does for support in the form of admission fees and the commission on works sold, finds that the "outside" talent of the country is not sufficient to support an enterprise of the kind, and that foreign artists paint better and cheaper pictures, adapted to the "taste" of the day, than are produced at home? There must be something sadly deficient either in our art-gifts, or our art-teaching, or both, when this is acknowledged to be the case. Without making further reflections on the subject, we now proceed to take a glance at the exhibition before us.

Giving precedence to the contributions of English artists, we first recognise a clever bit of character painting in J. Hayllar's "Haymaking," showing a dark-eyed, plain-looking girl, in a straw hat a little the worse for wear, looking out of the canvas as bold as brass. J. W. Holyoake, who was formerly curator of the schools at the Royal Academy, is more successful in the conception and study than in the execution of his little picture, "The Hour, but not the Man." The scene is the laurel-shaded porch of a south country cottage, whence has tripped out a young damsel attracted by a coming footstep, which, however, her quick and disappointed glance discovers not to be that of the admirer she was expecting. There is a nice dash of colour about the canvas, but the distance, both through the doorway in the middle, and the trees on the left, is inadequately realised. Haynes Williams paints Spanish brunettes in the style of Phillip with considerable success. He is, however, happier in his single-figure subjects, of which he has two, than when he attempts sentiment, as in "Adios," where the cavalier is a very namby-pamby personage. H. H. Martin paints a very tame group of a woman sitting by a window nursing a child, to which he seeks to give adventitious attraction by describing it as "During the Siege of Paris." But there is no suggestion of that fearful ordeal in the features or surroundings; and the execution in many parts, more particularly the child's hand, is very slovenly. C. Calthorp, who took the Academy prize a few years ago, and has since shown little sign, now appears with a spirited version of the well-known scene of "Charles Surface Selling the Family Pictures" in the "School for Scandal." The group of Charles, Sir Oliver, and Moses leaning over the shoulder of the latter, is especially animated; and that of the two toppers who still stick to their brew of punch at the end of the table makes a telling episode. The room, which is said to be studied from an interior at Knowle, with all its handsome furnishings, is well set out and ably painted; but a little delicacy of finish in the flesh surfaces is desirable. "The Golden Hour that Fadeth into Night" is the title which P. R. Morris appropriately gives to a charming idyllic composition representing two graceful, delicate-featured girls, one carrying a pair of milk-pails, the other a basket of wood, walking across the village common, whilst a couple of beautiful white calves trot contentedly before them. A cool, tender crepuscule covers the pleasant English landscape; the light smoke from the cottage in the background rises straight into the air; the slightly-tinged clouds which hang over the spot where the sun has just set are reflected in a pool of water near the foreground, everything combining to conjure up those feelings of calm and contentment which poets tell of in pastoral life. "Grandmother's Visitor," by A. Morgan, is an exhibition of the mischievous pranks of a raw-looking child, childishly treated. The artist should go back to school if he cannot do something better than this. "Maria Composing the Letter to Entrap Mal-

volio," by A. F. Patten, might be any other smirking miss writing to any other silly fellow; but it would be as well if she had her face a little better painted, and not scumbled as it is here. We close our review of English figure subjects with the headlong, tearing gallop of "Mazeppa"—but oh! Mr. O. Madox Brown, is this a specimen of your best work?

In landscape our artists do not come out very strong in this room. What is the reason of it? Is it that through the influence of railway travelling and photography we have lost the love of exploration and the feeling for Nature in her more secluded haunts which inspired the hands of the masters of a bygone generation? Is it that in emulating these two potent agencies, in respect of speed alone, we cannot give time and attention to finish our work as it should be? J. Finnie's "The Stream" is meritorious in the intention and in the main effect, with its fine green breadth of foreground, and its distant sunset, the character of the former almost reminding us of Ruysdael; but there has not been that care bestowed upon the finish which the subject deserved. So C. Lucy's "On the Wye," described as "a study," contains materials of promise, the promise of which has been utterly destroyed by slovenly treatment. G. B. Yarnold's "Scene in Wales," is sadly heavy and opaque, wanting all feeling for air and transparency; whilst J. Peel's "Abbey Farm," is unpleasantly weak and dabby in colour. One of the most satisfactory performances in the latter respect is A. B. Collier's "Streatley Mill, on the Thames," which is not hung quite so well as it deserves. MacCallum's fine impulsive style is well exemplified in "Over the Downs so Free," the general aspect of which, at a respectful distance, is very commanding. But when we come to look into the picture we are disappointed at the looseness of handling which prevails throughout, more particularly in the mid-distance.

Of the foreign contributors, D. Col claims notice for his two very highly-finished miniature-sized pieces, "A Political Discussion" and "The Tasters," which are placed on the line over the chimney-piece. They are both two-figure compositions, and are not devoid of character, but, as usual in works of this class, the elaborate manipulation of the details is their chief merit and attraction. Between them stands a gem of thought and execution by E. Feyen, entitled "Vraic Gathering, Waiting for the Ebb Tide." We have here a low flat shore, beyond which extends an expanse of calm sea, under a gray sky; three horses, admirably studied, waiting, like their masters, for the work which will begin at the ebb of tide. V. Lagye, a pupil of Leys, has a small study, entitled "L'Attente," of a girl, with highly devotional expression, leaning against the back of a chair in a church; an effort of Mediaeval revivalism for which the painter's master was celebrated, but which we think and hope has seen its day, at least with us. There is genuine truth and power in Van Haanen's "Little Marauder," a bold little hussey purloining fruit from the dessert-table, and casting a furtive glance on one side, as if apprehensive of detection. The colour is sound and pure, and manipulation, throughout, without being over laboured, conscientious and effective. This is particularly remarkable in the fruit, glass, &c., which, though boldly and largely brushed, are almost illusively real. F. Bossuet's "La Tour de l'Or à Seville" is a tea-boardly affair; his other view, "La Casa del Moro" at Grenada, is a more satisfactory performance, the picturesque assemblage of buildings of various hues being picked out with a broad firm brush, under a temperate atmosphere. E. Binyon's two landscapes, "Beaching a Fishing-boat, Capri, evening," and "The Beach, Capri," are noticeable only for their outrageous unfinished. In A. Wust's "Waterfall on the Hardanger-Fjord, Norway," there is little notion of fluidity, and less of the power of gravitation, as affecting fluids. J. Van Lerius,

whose "Lady Godiva" met with some admirers in the late International Exhibition, has here another nude subject, under the denomination of "Idylle;" but there is little of idyllic charm about the scene, or of formative beauty in the little dull model who dabbles her feet in a shallow stream. The colouring, also, which was bright and exhilarating in the artist's other work, is here dull and unhealthy. As a specimen of costume treatment, most nicely tricked out, we may refer to P. Vander Onderaas's little bit, "After the Storm," in which we see an insipid young lady, equipped in unexceptionable blue silk tunic, drab skirt, and brown high-heeled boots, clasping her hands in horror at contemplation of the ravages committed by the elements on her favourite rose-tree. On speculating a little below the surface of the costume, however, we have serious misgivings as to the substantiality of the fair creature, and especially as to the articulation of the limbs which are supposed to terminate in the aforesaid boots. O.

THE NATIONAL GALLERY.—TERBURG'S "CONGRESS OF MUNSTER."

The National Gallery, which was opened to the public, after its usual autumn vacation, on Monday last, has received an important and valuable addition to its treasures in the Dutch School, which, following close upon the recent acquisition of the Peel collection, renders it one of the richest, in this department, in the world. For this acquisition we are indebted to the noble liberality and public spirit of Sir Richard Wallace, who happened to have purchased the picture on behalf of the late Marquis of Hertford, at the sale of Prince Demidoff in Paris in 1868, for the large sum of 182,000 francs, or £7,300. It happened, curiously enough, that on that occasion the representative of the British National Gallery had bid up to the amount of £7,000 for the picture, hesitating to proceed beyond that amount. Well, Sir Richard Wallace, who has since succeeded to the bulk of the estate of the late Marquis, now feels a pleasure in passing over the disputed trophy to the nation as a free gift, and has done so in a very handsome letter, which in every way does him honour. The pedigree of the picture is complete from the day on which it left the master's hands, and in connection with this subject it is curious to record the prices at which it has changed hands even within our own time. In 1804 it was sold for £640; in 1837 it was bought by Prince A. Demidoff, at the Duke de Berry's sale, for £1,890. It was last sold, in the collection of Prince Demidoff, in Paris, in 1868, for £7,300.

This remarkable picture, which is painted on copper, and measures only 17in. by 22in., represents the sitting of the Congress of Munster at the moment of affirming the conditions of the peace of Munster, which ended the thirty-years' war, on October 24, 1648. Terburg resided for many months in the city for the purpose of obtaining the portraits of the envoys, some seventy or eighty in number, which were afterwards combined in the picture itself. The careful observer will not fail to remark the admirable judgment and skill with which this numerous body of personages, all represented in whole length, are made to maintain their individuality, and yet to contribute to the *ensemble* effect without an appearance of awkwardness or crowding. This is in great measure owing to the arrangement in plan, placing the principal personages surrounding a table, with the president, under a glittering canopy, behind them. The prevailing hue of the dresses is black; but this is broken at the extremes and in the midst by the introduction of crimson, amber, &c. The wonderful individuality maintained by the several assistants in this miniature group is a real triumph of art. With the Bible lying between them, the Spanish Plenipotentiary swears by laying his hand on the cross,

whilst the Dutch Plenipotentiary rests his hand on the sacred volume in testimony of his oath. A colleague of the latter is reading the conditions of the treaty from a paper, which is eagerly scanned by another at his side. The Protestants pledge their faith by holding up their hands with the first two fingers extended; the Spaniards are less demonstrative; but it would involve a serious theological inquiry to appreciate all the nice details of this wonderful production. Our young aspirants in art could not do better than make a careful study of the learned purpose and exquisite hand-work displayed in every line of this marvellous creation, which, be it added with pleasure, is in a perfect state of preservation, its every line and hue as sharp and as perfect as the day it was painted. The effect to the spectator is a little marred by its being placed within a glass, which, considering the solidity of the work, might, we think, be dispensed with—during the hours of public exhibition at least. O.

BUILDERS' BENEVOLENT INSTITUTION.

THE twenty-fourth annual dinner in aid of the funds of this Institution took place on Thursday evening, the 2nd inst., at Willis's Rooms, King-street, S. James's. George Plucknett, Esq., of the firm of Cubitt & Co., and Treasurer to the Institution, presided, in the unavoidable absence of the President, Joseph Taylor, Esq., of the firm of Messrs. George Smith & Co., and there was a large attendance of the members and representatives of most of the building firms in and around London, the guests numbering about 200. The Institution, as most of our readers may be aware, is supported by voluntary contributions, and has for its objects the giving relief and granting pensions to decayed members of the various branches of the building trade and their widows, and it also affords temporary relief to workmen in case of accident. At present the Institution has 20 male and 26 female pensioners on its books, the males receiving £24 each per annum, and the females annuities of £20 each. The usual loyal and patriotic toasts having been duly honoured, Captain Bird, of the Victoria Rifles, responding to that of "The Army, Navy, and Volunteers," with which his name was coupled,

The CHAIRMAN, in proposing the toast of the evening, "The Builders' Benevolent Institution," urged the company present to subscribe to the funds of the charity to the utmost extent of their power, for the money would not be wasted. He had for a long time actively co-operated with those who conducted the working of the society, and he knew that everything was managed in the very best and most economical way, and in a manner conducive to the general welfare of the Institution. (Hear, hear.) There were now 46 pensioners on the funds of the Institution, and though, on the whole, the Institution had progressed satisfactorily since its establishment in 1847, it now strongly appealed to the building and kindred trades for increased support on the ground that it was not able to accomplish all that could be wished. (Hear, hear.) At every election four or five poor old applicants were obliged to be sent away because the funds of the Institution were not sufficient to allow of the election of all the candidates. The elections only took place half-yearly, and six months was a long time for those who were 70 or 80 years of age to be put off; to say nothing of the fact that some of the applicants had to wait five years or more before they were elected. He therefore asked the building trade to do its duty to the Institution, for he held that, next to one's own family, it was a man's duty to endeavour to do something towards providing for those of his own calling who had not been so fortunate as himself. (Cheers.) A few months ago his (the Chairman's) old partner, who had been a liberal contributor to the funds of the Institution for many years, was on his death-bed, but he thought of the Institution, and left it a legacy of £500. Such an opportunity of dealing so liberally with the Institution might not be afforded to every one present, and therefore it behoved them all, while they had health, vigour, and prosperity, to do all they could in aid of the objects of the Institution. If all did their part, he did not despair of eventually being able to provide for every applicant for the benefits of the Institution, and also to increase the amounts of the annuities to both men and women. (The toast was drunk with great enthusiasm.)

Mr. G. BIRD, the late Treasurer, in proposing the toast of "The Chairman and Treasurer," said that

the Institution had always found in Mr. Plucknett a first-rate Treasurer and a great friend to the charity (Hear, hear). He had also, at a very short notice, undertaken the duties of Chairman that evening, and had fulfilled his position with great ability. He (Mr. Bird) regretted, however, that many of the old friends of the charity were not present to support Mr. Plucknett. The Institution had not progressed, in his opinion, so satisfactorily as the Chairman considered it had. He had hoped that by this time they would have had a building fund of at least £5,000; not that he wished to see the Institution building almshouses of its own, for he considered that, in most cases, it was a mistake to erect such buildings (Hear, hear). However, he occupied the position of Master of the Bricklayers and Tilers' Company of London, and there was a proposition now before the Court of that Company to give an almshouse or two to some of the most deserving of the recipients of the pensions given by the Institution; and if the friends of the Institution would support the scheme, he thought that, with the assistance he should be able to give as Master of the Company, it would be carried out. (Cheers.) Many of the old building companies of the City were very poor, and were fast dying out. His own company was a poor one, and had not much to give away, but it had very comfortable almshouses at Ball's Pond, and he thought that, with very little difficulty, some of these might be made available for a few of the poor recipients of the Institution's pensions. (Cheers.)

The CHAIRMAN briefly acknowledged the hearty way in which the toast was responded to, and proceeded to propose the toast of "The Patrons, Vice-Presidents, and Trustees," coupled with the name of Mr. Thomas Piper. (Cheers.)

Mr. THOMAS PIPER, in responding, made a humorous speech. He took a more satisfied view of the progress made by the Institution than Mr. Bird did, remarking that the only disappointment he experienced that evening was caused by the absence of the excellent President of the Institution, Mr. Joseph Taylor. (Cheers.) He was glad to hear what had fallen from Mr. Bird with regard to the Bricklayers and Tilers' Company and the Institution, for he felt convinced that the old guilds and companies would have their lives prolonged and their usefulness extended by co-operating with more modern institutions in the cause of charity and other good works. (Cheers.)

Mr. ROGERS next proposed the toast of "The Architects and Surveyors," coupled with the name of Mr. James Barnett.

Mr. BARNETT, as a surveyor, briefly acknowledged the compliment, after which,

Mr. A. G. HARRIS, the Secretary, announced subscriptions and donations to the extent of £360.

The remaining toasts were "The Directors and Stewards" (coupled with the name of Mr. Wilfrid Nicholson, and responded to by that gentleman), and "The Ladies."

Mr. Harker officiated as toastmaster, and the musical arrangements were under the direction of Mr. Winn, assisted by Miss Annie Sinclair, Mr. Fielding, and Mr. Montem Smith.

THE LATE FREDERICK WEHNERT, ARCHITECT.

THIS gentleman, whose death was recently announced in the *Times*, aged seventy years, was the pupil of Mr. Pocock, an architect; he was afterwards principal assistant to Mr. S. W. Dawkes, of Whitehall-place, when he greatly assisted that architect in designing and superintending the erection of the Colney Hatch Lunatic Asylum. Mr. F. Wehnert next entered the service of Messrs. Scott & Moffatt, architects, of Spring-gardens, London, where he first met Mr. John Ashdown, a pupil of that firm, and afterwards his partner. Messrs. Wehnert & Ashdown commenced practice February 24, 1852, at 42, Charing-cross. In 1853 they were selected, in competition, as architects and surveyors to the Committee of the Orphan Working School, for the management of their estates at Haverstock-hill and in the City-road. The Maitland-park estate at Haverstock-hill was entirely planned out, and most of the villa residences thereon were designed by them. In that year they also submitted designs, in competition, for laying out the cemetery for the Lambeth Burial Board, at Tooting. The several designs were submitted to the late Mr. Philip Hardwick, R.A., to report upon, and on his advice those of Wehnert & Ashdown were selected. Messrs. Wehnert & Ashdown were thereupon appointed the architects of the board, and superintended the erection of the several chapels, lodges, &c., and the formation of the cemetery. They were subsequently appointed architects to the London Cemetery Company, and superintended the formation of an extensive addition to the

Highgate Cemetery, with an addition to the chapel, and the construction of the only consecrated tunnel in England, from the chapel, under the high-road, connecting the two portions of the cemetery. This was done to satisfy the demands of the late Bishop Blomfield, who otherwise would not consecrate the new cemetery. Designs were submitted in competition for Tulse-hill new church, and the first premium was awarded to Messrs. Wehnert & Ashdown; they were instructed to carry out their design, and even went so far as to prepare the necessary working and detail drawings, but their design was never executed. Messrs. Bennett, the enterprising citizens of Cheapside, having invited designs in competition for laying out their beautiful estate, the Bennett Park Estate, Blackheath, those of Wehnert & Ashdown received the first premium, and the estate was planned out according to their design. The late Mr. Richard Cobden, M.P., having purchased the Farm House, Dunford, at Midhurst in Sussex, in which he was born, resolved to make extensive additions, so as to convert it into a mansion; Messrs. Wehnert & Ashdown were appointed to carry out his ideas. A perspective view of Dunford as executed by them was exhibited at that time in the Royal Academy. In this year, 1855, they also designed and superintended the erection of Ercall Vicarage, Shropshire, for the Rev. R. T. Forester. They planned the laying out of Cottenham Park Estate, adjoining the new Raynes Park Railway Station at Wimbledon, for Dr. Finch. They were next appointed architects and surveyors to Lord Mostyn, and to the Llandudno Improvement Commissioners for laying out and improving the now famous watering-place of Llandudno, in North Wales. The plan of that town was carried out according to their designs, and many mansions and public buildings were planned and executed from their drawings; among them were the Llandudno Public Baths, Pwllheli schools, Calvinistic chapel, bank, and library, &c. They were next offered a similar appointment at the town of Milford, Milford Haven, in South Wales; but as their practice was now getting so extensive, they thought it better to divide it, Mr. Ashdown retaining the surveyorship of Llandudno and the London practice, and Mr. Wehnert was appointed surveyor to Col. Greville and the Milford Improvement Commissioners in 1857. Messrs. Wehnert & Ashdown that year dissolved partnership.

Since then Mr. Ashdown has been also appointed surveyor to the Conservative Land Society, Norfolk-street, Strand, and Mr. Wehnert retained the surveyorship of Milford down to the time of his demise. He had two brothers, artists, who died before him; the drawings of E. H. Wehnert have been often published in the *Illustrated London News*, and are tolerably well known. Alfred Wehnert had also acquired considerable proficiency. Miss Wehnert, a talented sister, died a few days after her brother, F. Wehnert, as also announced in the *Times*. Mr. Wehnert was equally remarkable for his talent in his profession as for his generosity and kindly disposition. He leaves a widow and an only daughter.

Among the pupils of the deceased were J. D. Hayton, W. F. Potter, Chester Foulsham, R. E. Tyler, and H. T. Freshwater. W. F. P.

NEW MARKET AT BRIXTON.

THE failure of the Columbia, King's Cross, Hammersmith, and other general markets within the past few years does not seem to have had a deterrent effect upon the projection of similar schemes. It is stated that a project of this character is now under the consideration of the Board of Directors of the London, Chatham, and Dover Railway, for disposing of their unoccupied land and arches lying between the two lines of the Chatham and Dover Company and the London and Brighton Company's spur line at Brixton and Loughborough-road. The area of the land is about an acre and a half, and is bounded on the north side by the Metropolitan Extension line of the London, Chatham, and Dover Company, consisting of fifteen arches, and on the south side by the London and Brighton line, containing also fifteen lofty arches, the last-named line being on a higher level than the first. The whole of this enclosed area of land, as well as the two lines of railway at this spot, are the property of the London, Chatham and Dover Railway Company. According to the *Railway News*, this company is now, in accordance with the award of the arbitrators, engaged in turning to a profitable account this unoccupied property by the erection upon it of a wholesale and retail vegetable, fish, and general market. The market itself will be about 170 yards in length by 30 yards in width, exclusive of the railway arches. The position of the contemplated market is highly favourable as regards the several railways which would be its

feeders. The Chatham and Dover, the London and Brighton, and South Western trains would largely supply it with produce from their respective districts. The Great Eastern line would be an important contributor of fish when the junction of that line with the London, Chatham and Dover at Moorgate-street is made. This junction would enable the Great Eastern Company to run their trains over the Metropolitan Extension of the Chatham and Dover, and enable them to bring large quantities of fish from Yarmouth, Lowestoft, and other places on the east coast, and deliver it direct from the railway into the market at Brixton.

EASTWOOD CHURCH.

WE give this week photo-lithographs from the pen and ink sketches submitted in competition for Eastwood Church, Rotherham, by Mr. J. Edward K. Cutts, of London, architect. The conditions of competition were for a stone church to seat 600, and to cost £3,000, inclusive of fittings, heating, lighting, &c. In order to meet these requirements, and to be thoroughly substantially built, the church was designed in a simple style, relying on its proportion for effect. The roofs are to be of wrought deal, but without stain or varnish; the nave and aisles to be seated with chairs, and the chancel with stalls for the choir; the floors of the nave and aisles to be finished with cement of a warm red colour, and the chancel to be paved with encaustic tiles of ancient make; the lighting in the nave and aisles to be effected by an arrangement of gas jets projecting from the walls above the caps of the arcade, and in the chancel by means of standards and a good corona. The organ and vestry are placed on the north side of the chancel, the children are seated in the south chancel aisle, and at the end of the south aisle of the nave a separate entrance is provided for them to go in and out, without disturbing the congregation. The reredos and coloured decorations indicated in the drawing of the interior are not included in the stipulated cost.

To produce a really substantial and dignified building at the cost fixed was clearly a problem of some difficulty. There are three ways in which such difficulties are sometimes met. One way is to design an ornamental church which will really cost much more than the stipulated sum, in the hope that the committee will like it so much that they will be willing to stretch their original limit of cost in order to obtain a design so much more handsome than the others exhibited. Another way is to send in a design for an ornamental church, with tower, and spire, and traceried windows, and everything which will please the amateur eye, which is made to come within the stipulated conditions of cost and accommodation by a shallow chancel and low proportions, and by assuming that the area is crowded with seats in every corner where a sitting can be squeezed in. The third plan is to design a building which shall be substantially built, and shall give liberal space for the required accommodation, without hocking up the chancel or overcrowding the nave, which is brought within the stipulated cost by a careful avoidance of mere ornamental details and of other features which require labour, and which trusts for its effect to fine general proportions and artistic design in detail. This method seems to have been followed in the present designs.

THE COMPLETION OF A GREAT IMPROVEMENT.

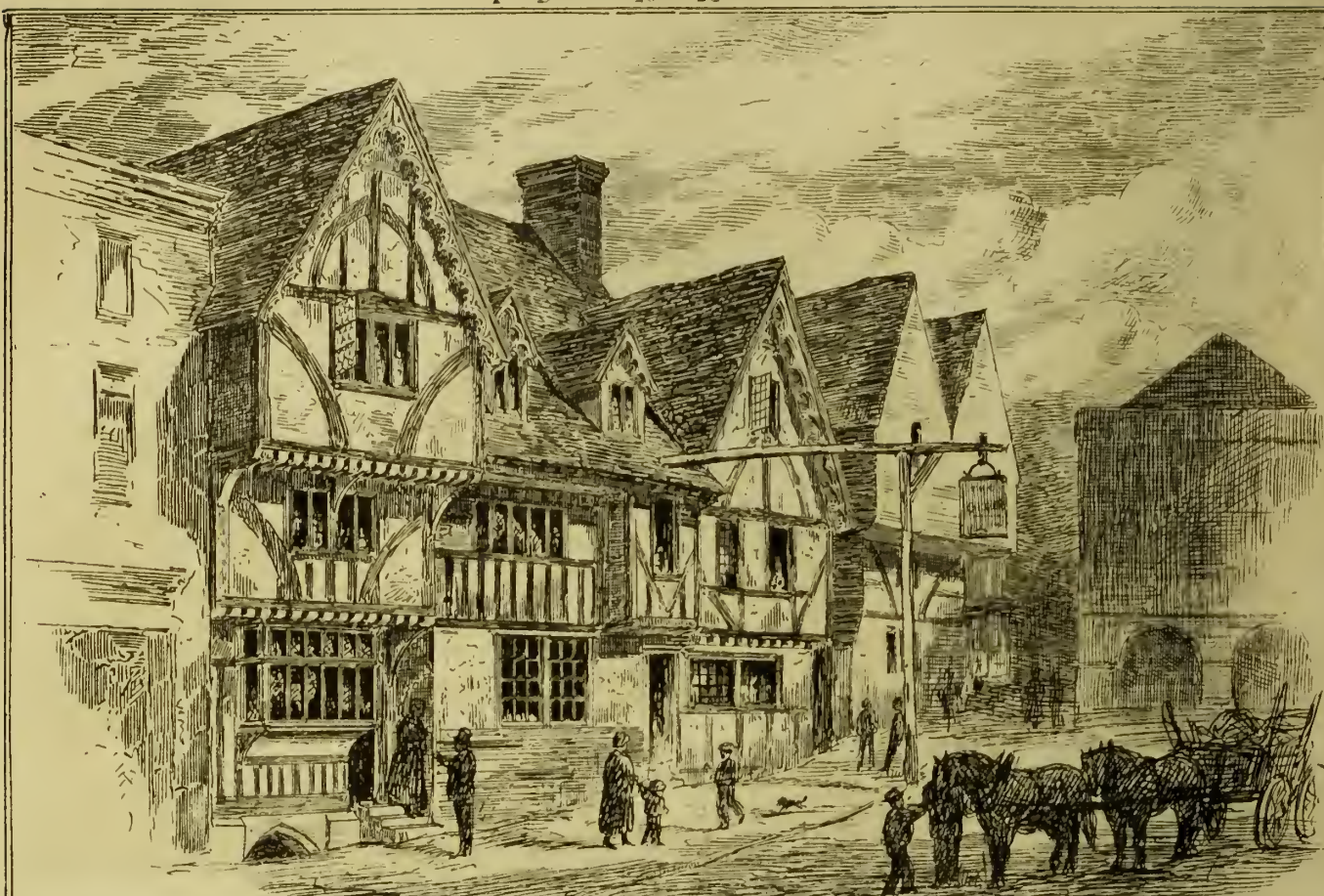
PERCY GORDON, writing to a contemporary, directs attention to a project which in his opinion demands execution before the Thames Embankment and Queen Victoria-street can be fully taken advantage of. He says "No Hansom-cab driver in his senses would think of going round by Whitehall-place, and probably not even a public official would go to the absurdity of pointing to the narrow, steep, and tortuous Villiers-street as the connecting link we are in search of. The half-finished works at the bottom of Craven-street, about which Mr. Ayrton seems incapable of making up his mind, are an equally insufficient solution of the difficulty. The only rational plan left is the one I would venture to recommend should be carried out at once—namely, to continue Cockspur-street in a broad straight line right on to the Embankment. The triangular piece of land which lies between the Charing-cross Terminus, Parliament-street, and Whitehall-place contains, besides its frontages in those streets, nothing of importance or value, save the Duke of Northumberland's House, and the mysterious and chaotic jumble of buildings known as Scotland-yard; the rest of the property is occupied by tumble-down cottages, deserted yards, and pretences at gardens which serve the more utilitarian purpose of dustheaps. If neces-

sary the Duke should be hought out; sooner or later this road will have to be made, unless the new route is to be practically deserted. The most sensible plan would be to buy up the whole triangle, most of which is already Crown property—to make a broad and handsome thoroughfare through the centre; and to make the improvement not only cheap, but absolutely profitable, the whole of the remaining land might be sold for building purposes. Of course there is no necessity to point out the splendid architectural advantages this plan would confer upon the central portion of London. An energetic and public spirited Minister of Works would improve the metropolis in an incalculable degree, and completely rearrange the traffic, which at present chokes all the West-end thoroughfares which converge at Charing-cross, by carrying Pall-mall through the Green park, by bringing the Mall from Buckingham Palace through to Charing-cross, and by the third and greatest improvement, on the subject of which I have ventured to address you."

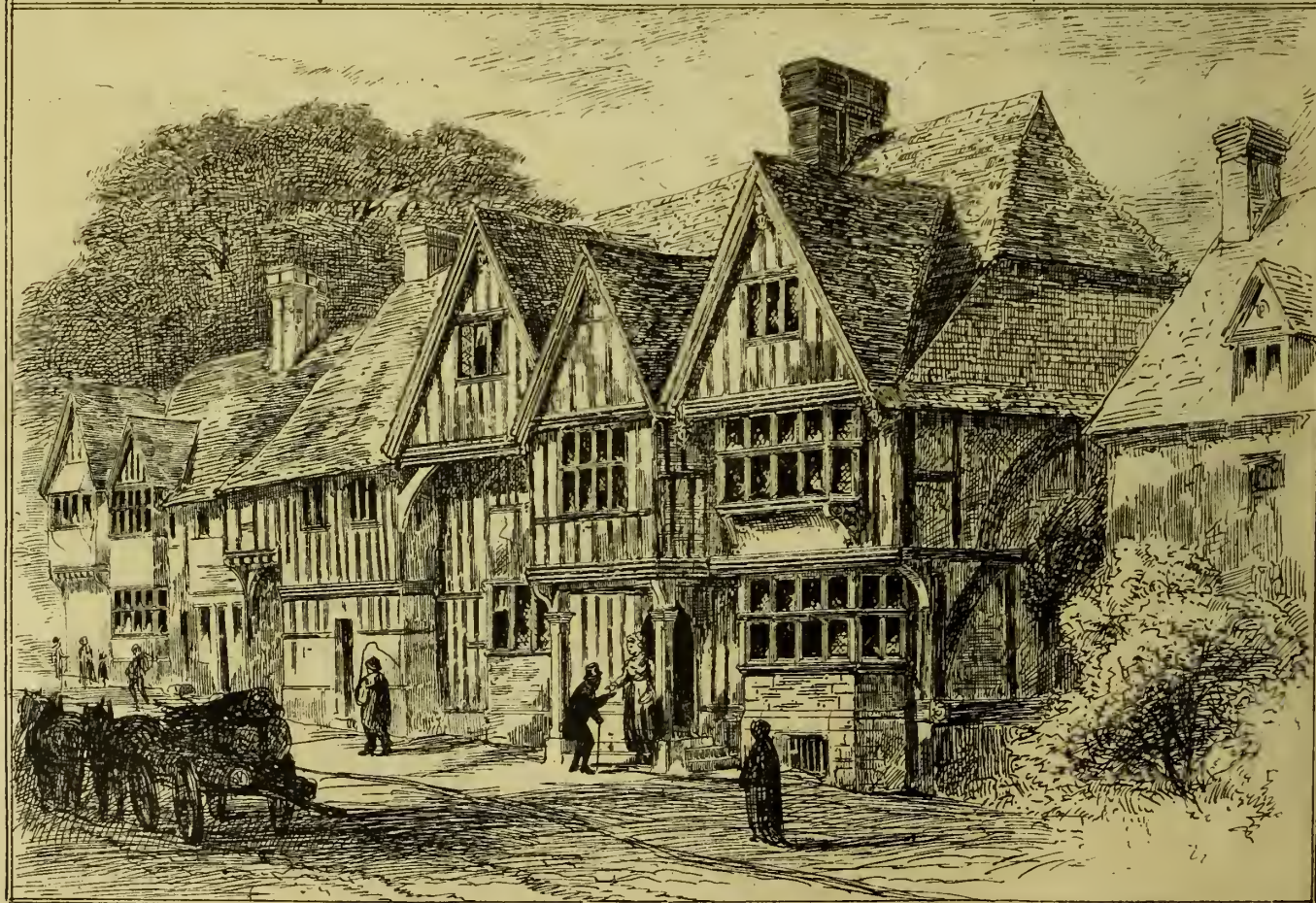
BOOKS RECEIVED.

Stones of the Temple, or Lessons from the Fabric and Furniture of the Church. By Walter Field, M.A., F.S.A. (London, Rivingtons) is a well-considered attempt to teach the principles of Christian architecture by means of a simple story of country life, in which the efforts of the author are well seconded by the good engravings and printing supplied by the publisher. *The Old Church of Fairford and its Stained Glass Windows*, by J. P. (Fairford, T. Powell) is a handy descriptive pamphlet, giving a full account of the quiet old church and its wonderful windows. *A Treatise on Ventilation*, by Lewis W. Leeds (New York, Wiley & Son; London, Trübner & Co.) is a reprint of a series of lectures originally published in the *Journal of the Franklin Institute*. The author's design has not been to contribute an elaborate treatise on the subject of ventilation, but rather familiarly to illustrate a few general principles, and his book is a very fair resumé of all that is known and has been done for the furtherance of this most important of the social sciences. *A Treatise on the Resistance of Materials*, &c., by Dr. Volson Wood (New York, Wiley & Son; London, Trübner & Co.) embodies the subject of lectures delivered by Professor Volson Wood to the senior class in civil engineering in the University of Michigan. *A Handy Book on the Ecclesiastical Dilapidations Act, 1871*, by Edward G. Bruton (London, Rivingtons) will be welcomed just now by newly-appointed diocesan surveyors. The author—himself recently appointed to the surveyorship of the Diocese of Oxon—considers the recently-passed Act far from perfect, but still, as a starting-point, valuable. In his opinion, if followed by a terrier act, and another on fixtures, there would be little more required. *Intuitive Calculations*, by Daniel O'Gorman, twenty-fourth edition, edited by J. R. Young (London, Lockwood & Co.) is an enlarged and carefully-prepared edition of O'Gorman's valuable system of intuitive calculations. The author, who was one of the passengers in the ill-fated *London*, was a pupil of Professor Young's, and this circumstance determined him to reproduce the work. The idea of the work is that it should form a practically useful supplement to the ordinary treatises on common arithmetic. Every business man who has much to do with figures knows that in many commercial calculations special rules have to be invented for the occasion, or the result would be a prodigious waste of figures. Mr. O'Gorman has successfully devised special rules for these special cases, and by their application a considerable amount of tedious work may be avoided. Vol. 2 of *Cassell's Technical Educator* (London, Cassell, Petter, & Galpin) is published, and has been sent to us. *Beaton's Pocket Estimator for the Building Trade* (London, Lockwood & Co.) has been prepared with the view of shortening the time usually required in the preparation of estimates. The prices given are accurate and up to date, and a good deal of information is given not easily to be obtained from the ordinary price-books.

SOUTH KENSINGTON SCHOOL OF ART.—Dr. Zerff resumed his fourth course of lectures on the Historical Development of Ornamental Art in the lecture theatre of the museum on Tuesday last at 3 o'clock. The attendance of students was unusually large, and the lecture was listened to with unshared attention. The announcement that the history of art would in future form a regular subject of study was received with loud cheers. Besides the usual prospectus, the Department had handbills distributed containing the principal points of the lecture.



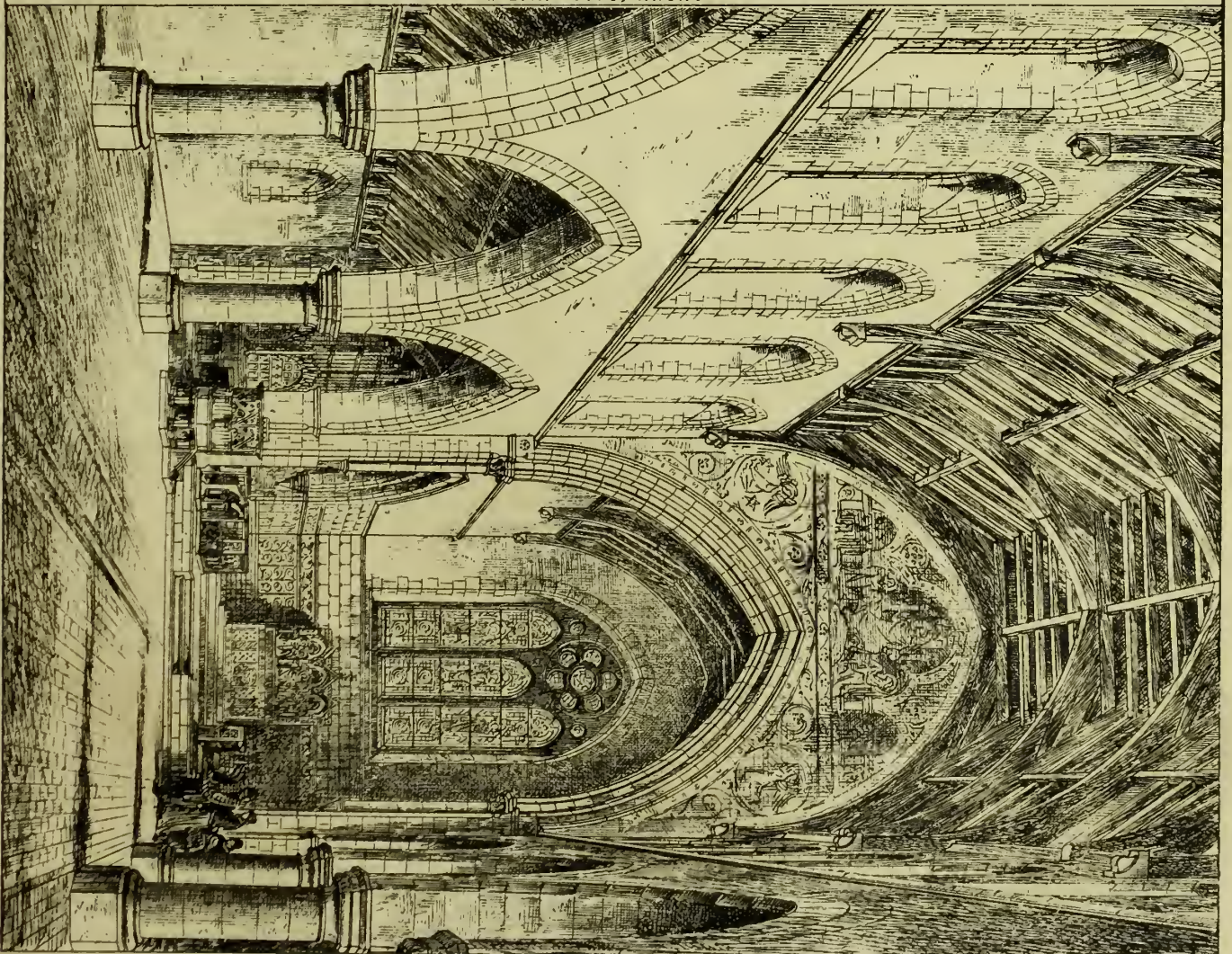
Examples of Half-timbered Houses Gubbidge & Chiddingstone Kent

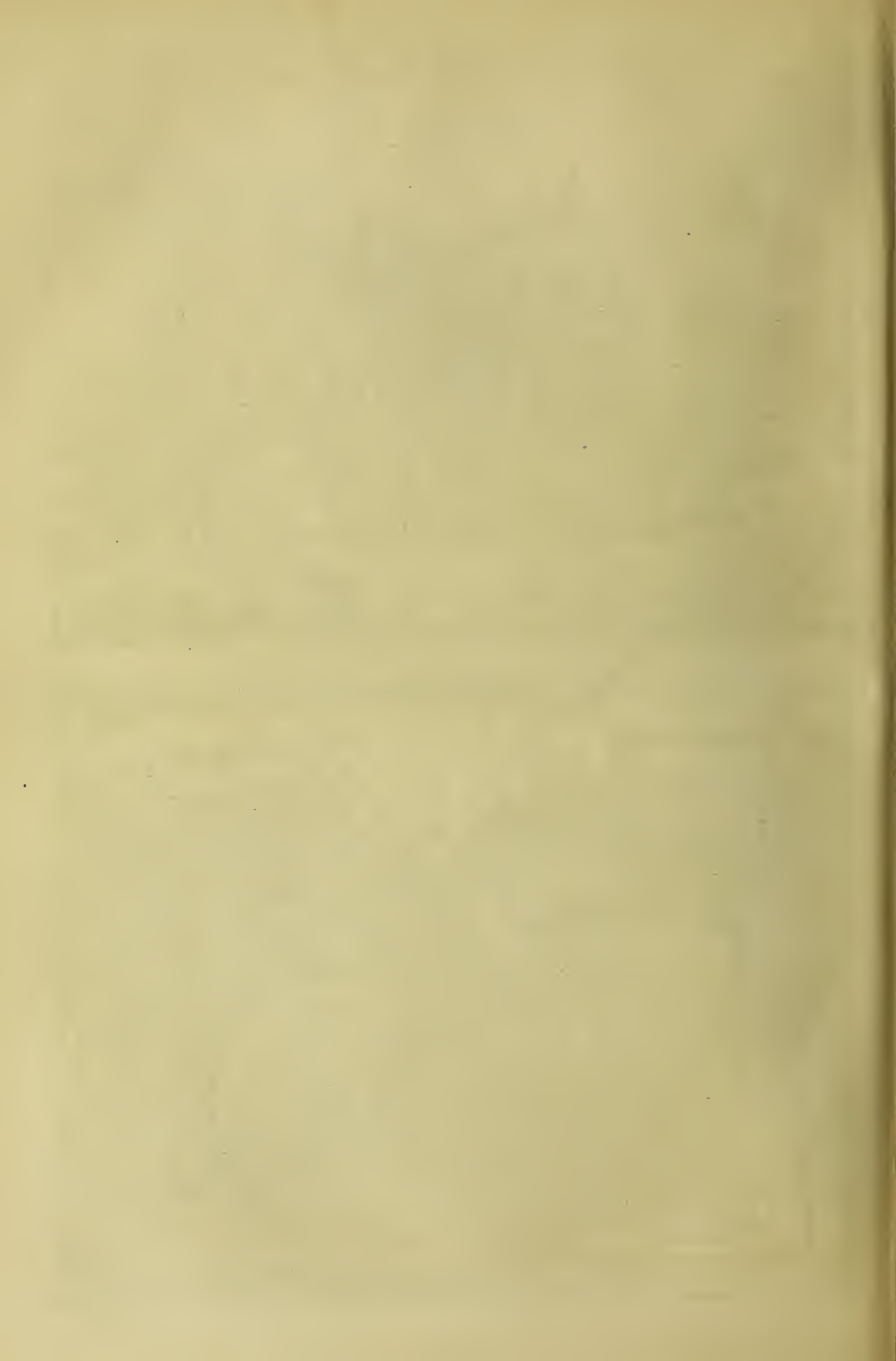




EASTWOOD CHURCH — EXTERIOR & INTERIOR.

J. E. K. CUTTS, ARCHT.





ART TEACHINGS OF THE INTERNATIONAL EXHIBITION.—IV.

BY OMICRON.

MOSAIC AND MISCELLANEOUS PAINTING
(CONCLUDED).

THE materials employed in ancient mosaic work, and the method of working, are very different from those now used in the revived art, or the processes substituted for it. In ancient mosaic the substances used to fill out the picture were real stones or vitrified substances, to which were sometimes added gold and silver, and the work—done from the front—consisted in fixing the pieces called *tesserae* in a stucco specially prepared, which dried as hard as stone, the resulting work being as fixed and permanent as the wall of the building to which it was attached. The modern practice is to employ baked clay *tesserae* of various sizes and colours, to arrange them in order on a table, face downwards, and afterwards to pour over the back of the mass of pieces so disposed the cement which is afterwards to form the wall, or the tablet to be attached to the wall upon which the painting is to rest. In the ancient practice, also, the construction of the painting being completed, the surface was rubbed smooth and polished; in the modern practice, the *tesserae*, being adjusted as evenly as possible by contact with the flat table upon which they are worked, are left without further treatment when the work is completed by the application of the cement. The ancient process claimed a superiority over the modern, therefore, under three distinct heads—first, its greater solidity and durability; secondly, the greater accuracy and closeness in the fitting of the *tesserae* (which were squared and fitted with great exactness by hand labour) than would be possible with clay *tesserae*, which always contract, more or less, in the process of burning; thirdly, the smoothness of surface, and the brightness of colour, obtained by the process of polishing, to which, from the very nature of the materials, and of the work employed, the modern mosaic could not be made amenable. We have spoken of the greater solidity and permanence of the ancient mosaic work from the manner in which it was put together; this result, however, was in great measure owing to the very condition of the walls themselves, of which the mosaic work, in fact, formed an integral part, in their freedom from the destructive influence of dampness. As in fresco and tempera painting, so in mosaic or its substitutes, the dampness of our climate is the insidious enemy the artist has to contend against. Many efforts have been made by our ceramic manufacturers to meet this great difficulty, and with more or less success, and some artists of respectable position have been induced to produce designs for representation in various forms of ceramic medium recently invented, though we are sorry to add that too many of these performances, some of which were seen in the International Exhibition, and others of which cover portions of the walls of the South Kensington Museum, indicate that the conditions essential to effective display in this department of painting are but indifferently appreciated by us.

With these preliminary remarks, we now turn to consider the principal new inventions and processes which compete for favour in the business of mosaic painting, or as substitutes for it. Amongst the largest producers in this branch of production, the foremost place, perhaps, is due to the firm of Minton, Hollins, & Co., who, however, restrict themselves to the mosaic process, carried out by means of baked clay *tesserae*, of sizes varying from an inch square to something like the sixteenth of an inch in their smallest dimensions. Their method of doing business, which, indeed, is like that generally pursued by others in the trade, is to take the picture or design direct from the artist, and to assume all the responsibility of its "translation" into their peculiar medium.

The large frieze round the upper part of the Albert Hall, intended to imitate sculpture, as well as several of the portraits of artists in the South Kensington Museum, have come from their *atelier*, which is situated within the precincts of the latter building, and the process may be briefly described as follows: A careful tracing of the picture having been taken, portions (in reverse) of about fifty inches square, more or less, are distributed to the assistants employed to execute the work, who are, for the most part, lady students of the Art Schools. With the original before them, they set the various *tesserae* required to make out the design; at first loose, but afterwards, when a portion is accurately completed, dipping the face of each into gum, in order to make it adhere to the paper. The several portions so completed are then put together, with a wooden boarder forming a shallow trough round them, into which the Portland cement is poured, which sets the whole. The paper is then removed from the face, and, when necessary, an iron band is placed round the work to bind it stronger together.

Messrs. W. B. Simpson & Sons, besides employing mosaic under somewhat similar conditions as Minton, Hollins, & Co., and others, resort to two substitutive contrivances, by which they hope more successfully to combat the effects of damp. Both these processes, however, should more properly be called ceramic painting, the arbitrary arrangement of *tesserae* to fill out the subject being dispensed with in them. In one, and, as we think, the most eligible of these processes, pieces of earthenware are cut out so as to correspond with the leading lines of the original composition; after which, each portion having been painted in vitrifiable colours, they are baked in the usual way. The pieces are then handed over to the mason, who fixes them in the wall, afterwards filling in the joints, very much after the manner in which in glass-painting the pieces are joined together with lead. The other of Messrs. Simpson & Sons' processes is, properly speaking, but a more simple application of the principle involved in the one just described. In this case the surface of the picture is made up of tiles about six inches square, upon which, when placed together, the design is traced and coloured; after which the tiles are baked, and then affixed to the wall. In both these processes it is held desirable to secure the picture in panels, which, being placed at ever so small a distance from the wall, to a great extent avoid the effects of damp.

In the above processes of the Messrs. Simpson & Sons, instead of the whole work being left to the hands of the mechanic, the subject might be put in by the artist himself. So, indeed, might the colouring also be done by him, but for a little technical difficulty which stands in the way. The colours used are what are called "pot colours," all of which change, more or less, in the process of baking, so that no idea of the ultimate effect of the colours would be presented to the eye during the process of painting, though it might be proximately realised in the mind of the artist if thoroughly acquainted with the changes which each particular pigment would have to undergo in the process of baking. But even then the ultimate production of his work would rest, in great measure, with the working mason; so that, all things considered, the probable result of the adoption of either of these modes of treatment would be to leave the execution of the work in the hands of mechanics.

The most important invention of the day, as a substitute for ordinary mosaic or ceramic work, is undoubtedly that of mosaic-painting, by Mr. Minton Campbell. In this process a surface composed of *tesserae* of a hexagon form, is put together, and held together by potter's flux—the extent of surface being either that of the whole picture, or of portions of it as may be desired. Upon this the artist paints much in the same

manner as he would in fresco, only with vitreous colours. The usual baking process completes and solidifies the work. As a matter of course, the thicker the paint is laid on the more effectually are the joinings of the *tesserae* concealed. Moreover, unlike frescoes, this process admits of alteration, we are told, almost to any extent, either by painting over or by substituting new *tesserae*—though we cannot but entertain some misgiving as to the feasibility of removing particular *tesserae*, when once they had been united by fluxing.

Such are the principal methods by which it is attempted to revive mosaic or ceramic painting amongst us as a means of wall decoration. It remains yet to be seen how far all or any of them will meet the requirements of the age, not only as involved in considerations of public taste and artistic ability, but also of economy—and this last question divides itself under two distinct heads: first, the cost of production; and secondly, the durability of the work.

Of the cost of production we have not any considerable amount of authentic data. From inquiries we have made, however, it would appear that it is a matter which, like all others in which more or less of artistic skill, or skilled labour, is employed, is open to a wide extent of latitude. The coarser descriptions of out-door ornamentation in mosaic may be done for £3 per square yard—indeed, the Albert Hall frieze was executed (probably under special favouring circumstances) at a much cheaper rate, the whole covering an area of 5,200 square feet, having cost £3,444. On the other hand, all finer in-door work would cost considerably and progressively higher, according to circumstances. The tilework of Messrs. Simpson & Sons costs about £25 the square yard; and the portraits of artists in the South Kensington Museum, which measure somewhere about three square yards, cost about £140 each. All the above figures refer to the materials and labour of production only—and include nothing for the artist who designed the picture. Upon this ground alone, we are forced to the conclusion that, as a general principle, the utmost extent to which this method of wall decoration could be made available would be strictly within the province of geometrical figures or arabesque designs, suitable models for which being once procured could be repeated again and again, subject to selection by the employers, just as is the case with paper-hangings, carpets, tapestry, and other products of artistic manufacture.

With regard to the second question—namely, that of the durability of such works of wall decoration, the language of Mr. Gambier Parry, in his report, is emphatically discouraging. "Let no one, however," he says, "suppose that these enduring materials of tiles and mosaic will stand against the effect of damp inside walls. The damp must come out, and with the irresistible power of its invisible steam will blow up any mosaic, and smash the incrustated tiles and glass, just as the tender roots of ivy, or still more tender fungus, will break to pieces the stoutest masonry." This should "give us pause" before adopting any of these processes upon a large scale, and then only experimentally.

Upon the subject of glass-painting, Mr. Gambier Parry reports very briefly, and in a not very encouraging tone. For ourselves, we are no great votaries of the art, which at the best involves obvious incongruities in principle, and which as at present carried out is open to the grave objection of obstructing and distorting the light, without supplying any adequate amount of beauty in compensation. One ignominious use to which glass-painting is now frequently applied was illustrated in some windows in the Meyrick Gallery in the International Exhibition—their duty being to "hide some unsightly objects outside." In some of these cases, in the words of Mr. Gambier Parry,

the windows "have not a single character of glass left, except that the pieces are joined with lead," the effect realised being, which was indeed intended, "that of a transparent blind." Could more be said in disparagement of a venerable but effete ornamental device?

ARCHITECTURAL ASSOCIATION.

THE first ordinary general meeting of this Association for season 1871-72 was held on Friday evening last, the President, Mr. Rowland Plumble, F.R.I.B.A., in the chair.

The following gentlemen were elected members of the Association:—Messrs. J. Smith, R. S. Lendrum, H. Whipple, L. A. Schuffney, W. Stair, W. Freeman, J. Brooks, F. Bargeman, George Langford, G. A. Barnes, H. O. Brown, E. Page, A. Ingleton, J. Conder, V. Trushawe, W. Wilson, G. Langshaw, and R. Eden.

THE PRESIDENT'S ADDRESS.

The annual report and balance-sheet of the Association, and the reports of the various classes, having been received and adopted,

Mr. ROWLAND PLUMBLE delivered the usual inaugural address. After thanking the members for the honour they had done him in electing him as their President, and promising to do all in his power for the well-being of the Association, he said: The year that has passed since you were addressed on a similar occasion by your late President, though unmarked by any one very important or leading event engrossing the interest of the world of architecture, has yet been productive of many interesting topics, which in accordance with past usages, I propose briefly to mention.

Undoubtedly the event of most interest to us as students which has happened outside our own society has been the holding for the first time, in the rooms of the Royal Institute of British Architects, of a Conference of architects from all parts of the United Kingdom. I trust I shall not be thought egotistical in claiming some share of credit for our Association when I venture to say that this meeting was the fulfilling of a policy which has been practically advocated for some years past by us, and which to some extent had previously been carried out in the establishment and working of the Architectural Alliance, but which, on account of the principal architectural society (viz., the Institute itself) failing to co-operate with it, cannot be considered to have accomplished the purposes it had in view. This must not be said of the Conference. Undoubtedly it was of great interest, and I look to its annual occurrence as most important to our well being, and trust that this Association will ever be ready to help it in any way that may be needed.

In the report of the President's address at the Conference, I do not see mentioned the idea of the fusion of the architectural societies into one large body, advocated by him in his address at the opening of the past session of the Institute; nor to my knowledge has that idea been since noticed to any extent. I cannot but regard this as fortunate, feeling that such a proposal would meet with no approval from us, and that no good could arise from the discussion of a subject which at once proved itself to be so distasteful to at least one of the largest societies sought so to be incorporated. I think we may, therefore, now consider that no further notice need be taken of this proposal. But though advocating the keeping apart of the Association from other societies as regards its independence of Government, I most strongly advocate the co-operation by us in every movement which has for its object any purpose similar to our own.

A subject having a direct bearing on the interests of our members is doubtless that of the ownership of architects' drawings, which has been raised by her Majesty's Chief Commissioner of Works and Public Buildings and the architect of the Houses of Parliament. Special interest is attached to the drawings in dispute, from the fact that they were the works of Sir Charles Barry, and, it may be presumed, of Pugin, who assisted him so materially in the execution of the detail. Doubtless many of them are in themselves works of art, not paid for as such, but worked out with zealous care and the love for our art itself which their authors would delight in bestowing upon them, and though of course necessary for the carrying out of the building, yet in themselves works which would have been retained and copies supplied had there been even a suspicion of their being removed from the artist's possession. The strong moral claim to their custody by the representatives of the architect which, I believe, exists, was one which the hard, dry, legal

mind could not appreciate, and the decision of the law officers of the Crown, whose award, no doubt, was above suspicion, was dead against the profession. Most unfortunately, just at the time a dispute came on for trial in respect to the ownership of an architect's drawings which put the case in the worst possible light as far as the architect was concerned. He sued his client for payment for professional services in preparing the designs of a building which was not carried out, and alleged that by the custom of the profession the drawings were to be kept by him; in fact, that the client was to pay him for his time and skill in preparing the design, but that his client was to receive virtually nothing for the money he paid. Now, to say the least that can be said on the subject, this was a case put in the most awkward way for us professionally, and we need not be surprised that an adverse decision to our view of the question was given, notwithstanding that strong evidence of custom was given. An appeal was made against the decision, but the first verdict was not altered. This case, combined with the giving up of the drawings of the Houses of Parliament, seems to settle the question of the ultimate ownership of the contract drawings where no special agreement or proved understanding exists between the parties interested, and I must confess that I think it would be unwise further to contest the matter on its own merits, as both legal and public opinion would be against us. The question is, then, how are we to get over that difficulty? Shall we, as architects, cease to make our drawings valuable as artistic productions, and execute mere diagrams, which, though they may serve for the carrying out of something, will leave the authors very much in ignorance of the effects until the work is completed? As an architect, and in the special interest of our draughtsmen and assistant students, I say, Certainly not; the best work will still be, probably, that of the most carefully drawn and thoughtfully-finished working drawings. But how are we to avoid the having to part with that which our care and loving work has made valuable to us? A special contract with a client stating that the drawings were to remain our property would, in nearly every case, particularly on the part of young architects, be inconvenient, and liable on the outset to create suspicion and doubt against him. I would propose, in cases where clerks of works are employed, to at once make the copies of the drawings deposited on the works the contract drawings, the originals being made attested copies left in the care of the architect. In other cases, I would keep the drawings I valued, and have copies or tracings made, which should also be made the contract drawings, and which the client in both cases would probably value more, as such, than he would the original works. If that practice were carried out more generally, which exists in some offices, of demanding the builder's copy from him at the close of the work, and of handing it over to the client, this question would hardly have arisen. Its ventilation by the public has done no good to us professionally. Notwithstanding this, I venture to hope that architects will not cease to expend their best thought on their drawings, and that they will keep those they value as heretofore, rather going to the expense of extra copies than parting with works they regard more as works of art than as the means to an end. If they do, the demand for the best work of our draughtsmen will continue, and its quantity will be increased. And this view of the matter is the one that would probably be taken by the majority of our members.

The relationship that should exist in the profession of an architect to that of a quantity-surveyor is a question that cannot fail particularly to interest us, engaged as many of us are in the work pertaining to this special branch of our profession. The policy of the Institute, to whom we naturally look for guidance in all such matters, would seem to be adverse to the joint practice of the two callings, inasmuch as its Fellows are prevented from taking out the quantities of the buildings designed by other architects. This action on the part of the Institute is in perfect conformity with the traditions of thought and opinion which have governed it for so many years, during which the exaltation and glory of the artist-architect, as such, to the exclusion of the architect as a practical and business man, seems to me to have been and to continue the aim of its advisers. But is this a view which we should take as a society of young architects and students? I venture to think not. If there is one course beyond another that can give us a thorough insight into the detail and practical work involved in the execution of our buildings, and which will enable us to superintend their erection in the most efficient manner, it is that of taking out the quantities required in their erection. It is almost tantamount to building the work before the contractor is called in, and on this

ground alone I would strongly advocate the learning to make out the bills of the materials required in our buildings. I do not think, either, that an architect's position as an artist and professional man can in any way be compromised by such a course; in fact, much harm has been done to the profession by the undue exaltation of the architect as an artist alone, until the public have come to regard him as a man who considers attention to the practical details and outlay required in the execution of his buildings to be something entirely beneath him, and, under this impression, people are often heard stating that what they require for their building is a good practical surveyor, and not an architect. Now such an idea must injure us who aspire to the practice of architecture, as the objection would seem to hold with double strength where young men are engaged. But I venture to think that where it is known that the architect has previously carefully computed the exact amount and description of each item of work required, the client will have a much greater confidence in his power to carry out his building successfully. I cannot see anything derogatory in an architect's taking out his own quantities, and I strongly recommend every member of this Association not to neglect this branch of his profession, and to resist every effort that may be made to make it appear that its exercise is one that will prevent him from taking his stand in the front rank of his profession. In cases where the quantities are not made the basis of the contract, or in which it is inconvenient to allow the builder time to verify the quantities before signing his agreement, I would advise the young architect to call in the services of one of his brother professional men, who could represent the builder, and with whom he can jointly execute this branch of his professional work, rather than to give up the opportunity of acquiring the insight into his building that such a method would give him. Of course it is obvious that where an architect's time is fully engaged in that branch of his profession generally understood to be his special work, he cannot personally sit down to take out his own quantities. What we, as an Association, should teach is, that it is desirable for us to take our own quantities, and that no absolute distinction should be made between the architect and the quantity surveyor as being of different professions.

A rather important matter of professional practice has this year been settled by the Institute; and though, practically, its consideration may not concern us as students, yet it affects us closely as young architects, and will probably remove some of the difficulties that constantly arise in the path of the beginner. The manner of its settlement requires our special notice as being the possible beginning of a system for the settlement of all like disputes by courts of arbitration of experts, having special experience in the matters requiring their adjudication. I refer to the new form of conditions for building contracts, printed and published in its "Transactions" by the Institute, as agreed upon by a committee of its own members in consultation with representatives of the building trade, and with their approval. The way in which this matter was conducted reflects great honour and credit on the parties concerned. The conditions are such as we may safely adhere to, and we may learn from the requirements published that which we need in our transactions with builders, and also we may learn from the way in which they were drawn up a useful lesson how to meet them in the adjustment of cases in dispute. The relationship which I see in the conduct of this matter and the establishment of courts of experts for the settlement of all disputes in building and other matters requiring special technical knowledge on the parts of the judges may seem very far fetched, but I regard it as a sign of the times; and the submission to arbitration on the part of mechanics and masters in the settlement of several gigantic strikes and other complications of late years leads me to hope that this system is gaining ground, and that before long we may have properly-constituted courts for the settlement of matters in dispute pertaining to our own profession. Only by such means can strict justice be ensured. The days will then be over of the legal umpires who now so often prove a thorn in the flesh to both architect and builder, one of whom, I was informed, took two whole days, at an expense of many pounds, caused by the attendance of counsel, surveyor, arbitrators, and witnesses, to find out the precise nature and use of a Norfolk latch! (Laughter.)

I regard competition, as at present existing, to be a source of loss to the profession, and peculiarly so to the younger members, who are most liable to be tempted to embark on its delusive paths. Let us do what we can to bind the profession throughout the country to one common course in this matter, so that only under proper precautions, and with due

guarantees for a fair adjudication, will it be possible for the public to obtain designs in competition for the works they require to be done on this principle. This is a matter specially in the hands of the younger members of the profession, for they it is who principally respond to the invitations to compete in so liberal a manner that those who issue them feel that they confer a favour in receiving the designs rather than in being the parties benefited.

The past year will be memorable chiefly as that during which the Albert Hall was completed and the International Exhibition opened, both practically under the direction of the Department of Science and Art at South Kensington. These authorities have, in my opinion, placed the profession under a great obligation. They have combined the exhibition of the sister arts of painting, sculpture, architecture, and music, in one grand scheme, and have given them buildings well suited for their several purposes. I cannot say that we, as architects, responded worthily to the invitation to exhibit. Of the public buildings so long talked of, the new National Gallery and the Law Courts, except as regards the foundations of the latter, are still projects only. The new City Library and the Learned Societies' house in Piccadilly are in progress. The St. Pancras Terminus Hotel can be more fairly criticised now that the scaffold is removed from the clock tower, though the west wing is not yet built. The St. Thomas's Hospital has been opened, and is now occupied. Among other buildings of note completed, or in progress, are the enormous hospitals or infirmaries built under the Metropolitan District Asylums Act, and also the London Orphan Asylum at Watford. In the City, the opportunity offered by the making of the new Queen Victoria-street for the erection of architectural buildings will be watched with interest. Among many, a building in Tokenhouse-yard, in the style of the latter half of the last century, seems to me deserving of special notice. The new General Post Office, now in course of erection, will be interesting to us as the result of a new system on the part of our Government, the architecture being that of the Department of Her Majesty's Works. The awful destruction of Chicago, and the burning of so many of the beautiful public buildings of Paris, will teach us their respective lessons. Any criticism from me on these foregoing subjects would, I feel assured, be tiresome, for they have been thoroughly remarked upon by the professional press in the most exhaustive manner.

It is to be regretted that this year there have been no Institute examinations in the Class of Distinction or Proficiency, although the wisdom of the new regulations has been shown in the increased success that has attended the establishment of the Preliminary examination, ten out of eleven candidates having passed, several of whom are members of our society. We must not forget that these examinations were established by the Institute in a great measure on account of the great pressure brought to bear upon them by this Association, and that we are looked to principally for a fresh supply of candidates for examination.

Having given an exhaustive account of the work of the Association, the President thus referred to the Architectural Art Classes:—I would also call your attention to the Architectural Art Classes, under the management of Mr. Waterhouse as Chairman, of your late President, and Mr. Watson as honorary secretary, together with a joint committee of the members of the Royal Institute of British Architects, the Architectural Museum, and this Association; in fact, we regard it almost as a branch of our own society, and we are anxious to induce our members to attend, and also to subscribe to the special fund raised by us in aid of its support.

Of course it should be the ambition of each of our members to gain admission as a student to the Royal Academy, and great help will be given, with a view to this end, by those who first attend its architectural school under the guidance of its master, our past President, Mr. R. Phené Spiers. Then there are the lectures on architecture and construction and on the arts of construction at University and King's Colleges, under the direction of Professors Hayer Lewis and Robert Kerr; and the Classes of the Department of Fine Arts, under the direction of Mr. E. J. Poynter, A.R.A. An evening school has been established under his management for the study of the living nude model, which some of our members may desire to attend. The instruction given by the Faculty of Arts at University College and also by the Department of Science and Art at South Kensington is intended more for the public generally than for strict professional teaching, but, doubtless, valuable information and art-training may be obtained from each of them by those of our architectural students who attend.

I have now completed my brief and imperfect notice of the means at our disposal for the acquisition of that knowledge and instruction which we are all anxious to gain, and which it is necessary that we should possess in a marked degree if we to excel in our profession. After a careful study and long experience of the working of our Association, I believe that its teaching, combined with the practical knowledge of work to be obtained in an office under the present system of pupilage, is the best means we can have for instruction in our profession. I cannot but think that the systematic training which the establishment of schools of architecture would give would in the long run prove injurious to the soul and spirit of the art itself. In art I would seek to glorify and bring forward the talent which is natural to one man, in preference to training a hundred who had not that special talent; and though we believe we do teach their profession to all who will work thoroughly with us, and who will combine our teaching with that of ordinary architectural office education, we would specially seek to develop the talent of those who possess natural gifts that specially fit them for our glorious profession.

Mr. Phené Spiers proposed, and Mr. Lacy W. Ridge seconded a vote of thanks to the President for his address, which was carried with acclamation, and the meeting terminated.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE first ordinary general meeting of this Institute for Session 1871-72, was held on Monday evening last, the President, Mr. T. H. Wyatt, in the chair. The following gentlemen were balloted for and duly elected as members of the Institute:—Mr. Joseph Goddard, of Leicester, as Fellow; and Messrs. Henry Hewitt Bridgman, of 183, Kentish Town-road, R. Adolphus Came (student), of 6, Warwick-court, Gray's-inn, and George Gard Pye, of 3, Bank-buildings, Colchester, as Associates.

The portrait of Sir William Tite, M.P., ex-President, painted by J. P. Knight, Esq., R.A., was then formally presented to the Institute. This is one of a series of portraits of past presidents, for which a subscription has been opened in conformity with a resolution passed at the last annual general meeting.

THE PRESIDENT'S ADDRESS.

Mr. T. H. WYATT, the President, then delivered the opening address. After some introductory remarks, he referred to the position and prospects of the Institute. He stated that when the last session was commenced the numbers of members stood as follows:—Fellows, 275; Associates, 235; and students, 7; total number, including all classes, 625. At the present time the numbers stood thus:—Fellows, 276; Associates, 243; students, 21; and in all classes, 644. He then observed that there were many Associates of the Institute whose age and professional status would fully justify their presenting themselves for election as Fellows, and he trusted that those who could do so conformably with the conditions of the charter would not hesitate to submit their names for that purpose. He further suggested that those younger architects who were pupils or assistants of members of the Institute should be encouraged to join as Associates. Referring to the Voluntary examination, he said that the cost of it was heavily disproportionate to the result obtained; so much so, that the Institute was certainly not justified in holding it oftener than was originally arranged—viz., once in every two years. Should the Conference also become biennial, it would, perhaps, be found convenient to let it alternate from year to year with the Examination. Since the opening meeting of last year, three Fellows had died—viz., Mr. Hardwick, R.A., Sir James Pennethorne, and Mr. Charlesworth, of Manchester; and two Honorary and Corresponding members, viz., Monsieur Duban, of Paris, and Signor Ignazio Gardella, of Genoa, had passed away. Of Mr. Hardwick the President could but speak with much personal regard. He was his (Mr. Wyatt's) master: he spent four years with him as a pupil while he was on the St. Katherine's Docks and the Goldsmiths' Hall; and if, at that time, the opportunities for studying the artistic part of his profession were hardly within reach of the architectural pupil (instead of being sown broadcast before him, as they were in the present day), he had at least the opportunity of seeing and studying most abundantly the practical part of his profession; and he never could feel sufficiently grateful for the habits of business and of punctuality which he inculcated, and for his constant teaching as to the high position the profession should occupy, and the necessity for an honourable and unswerving line of conduct in all who followed it. This time

last year he (the President) could not resist the opportunity of paying his meed of praise to the way in which the late Sir James Pennethorne had carried out the London University, in Burlington-street; he forshadowed the honour which was subsequently bestowed upon Sir James by his Sovereign, and expressed an earnest and sincere hope that he might long live to enjoy his repose and his laurels. That wish had not been realised; and that able, kind-hearted, and unassuming architect had passed away from us tranquilly and peacefully as his life had been spent. The President rejoiced to think that the Institute had publicly borne its testimony to Sir James's merit and his high character by presenting to him not only the Queen's gold medal, but a special medal "to mark their sense of his ability, courtesy, and frankness, and of the skill and intelligence he habitually brought to bear upon complicated and difficult questions of a technical nature." The late Mr. Charlesworth, of Manchester, was born in 1832, and died comparatively young. He was a pupil of Mr. Isaac Holden, and when a youth but twenty years of age, he entered the office of Mr. Speakman, whose partner he became in 1862. Monsieur Duban, of Paris, one of the Honorary and Corresponding Members of the Institute, died at Bordeaux, in September last year, when the cloud of misfortune and discomfiture was hanging so densely over his country. Her subsequent troubles had prevented, until lately, the removal of his body to Paris, and a complimentary funeral which his architectural friends and confrères in that city were anxious to realise. That wish had been accomplished, apparently with every success. The President here read an interesting letter from Prof. Donaldson, describing this melancholy ceremony, but it is too long for us to quote. The Hon. Secretary for Foreign Correspondence, Mr. Cockerell (who was fast recovering from a very severe illness), would, no doubt, at no distant period, prepare a paper on M. Duban's life and works. The architect of the façades of the "Beaux Arts" (especially the old one), and of the restorations of the Château de Blois, and of the house of the Count of Pourtales, in the Rue Tronchet, of the works for the Duc de Luynes, at his Château at Chevreuse, should always hold a high place in the esteem of English architects. His public professional position was not as high as it should have been; politically he was not fortunate: he opposed Napoleon the Third when President of the Republic, and on his succeeding to the throne M. Duban was dismissed from his position as architect to the Louvre, and from the superintendence of the works on the southern façade, which were then under his charge, but the Salon Carré and some of the other important rooms in the Louvre were also works of M. Duban. Signor Ignazio Gardella, of Genoa, was an Hon. and Corresponding member of the Institute.

Passing to other topics, the President said he had been asked, by those who took a deep and special interest in the Architectural Benevolent Institution, to remind the members of the Institute of the strong claims of that Society upon their aid and on their generosity. Though architects might be counted by hundreds, instead of units, as in the good old days of monopoly, there were only 256 architects subscribing to this fund, and, out of that number, only 150 members of the Institute. This was not a satisfactory or creditable state of things, and contrasted very unfavourably with the action of the Civil Engineers in a similar work of sympathy. Although the Institute numbered 519 Fellows and Associates, only 153 were subscribers to this professional society. Such a reproach should not exist any longer. It was not only architects themselves who sought its aid, but too frequently their widows and orphans, who needed a helping hand. The dictates of ordinary benevolence, no less than the claims of professional brotherhood, ought to secure for that excellent and well-administered charity the support and co-operation of the members of the Institute. If they could secure another 100 or 150 subscribers, or if some would double their present subscriptions, the boon would be great. Referring to his opening address this time last year, the President said he then indulged in certain Utopian dreams of union and fusion, and of a "single united and powerful body." He now ventured to think that a useful first step towards uniformity, at any rate, had been realised in the "Conference" held last session. Crude and incomplete as might have been many of its arrangements, experience had been gained and an interest had been called forth amongst their professional brethren in the United Kingdom which, if well directed, and guided with patience and judgment by the administrative body of the Institute, would most assuredly bring forth good fruit ere long. It was decided last year to renew the "Conference" in

June next, and special committees were appointed to consider the important subjects of professional charges, architectural competitions, and the employment of surveyors. The existing committee of the Institute on "Professional Education" had been requested to continue its labours, so as to have that matter fully discussed and disposed of at the Congress in 1872. The three special committees had appointed gentlemen to act as their secretaries, so as not to interfere with the general duties of Mr. Eastlake. Passing on to his next subject, the President said that the new "Metropolitan Building Act" did not seem to have made much progress during the last session. It was read a first time on the 10th May, and printed, but no further progress was made, and, if his recollection was correct, the Building Act promoted by the Liverpool authorities was thrown out in Parliament, some of its clauses having been considered unduly stringent and uncalled for, interfering very tyrannically with the rights of property. It would be gratifying to many present to hear that the school recently opened by the Royal Academy for the special study of architecture (and of which Mr. Phené Spiers was the master) was making steady progress. The annual number of architectural students admitted during the last ten years had averaged eight or nine per annum; there was every probability that in December next, for the coming session, the number would be doubled. It seemed most desirable that the course of study now instituted at the Royal Academy should be commenced in the earliest stage of pupilage by those who had entered it as probationers (a knowledge of design not being necessary for this purpose). Mr. Spiers would thus have a better chance of effecting good in the student's career, and of assimilating our system more nearly to that of the Beaux Arts in Paris. Mr. Spiers had lately been to Paris to study the operation of the system adopted at the "Beaux Arts," and at "l'Ecole Centrale" in that city, with a view to reporting to the Council of the Royal Academy on this important question. With reference to the new Law Courts, Mr. Wyatt said he had amused himself this autumn with cutting out and collating the various letters and articles that had appeared in the public papers on the subject of the Law Courts, and a more painful, bewildering array of criticism he could not conceive, or one more likely to paralyse and destroy the powers and energy of the architect. (Applause.) Could there be a more painful instance of the disapproving way in which our great public competitions were conducted; of the unsatisfactory nature of the tribunal to which designs so submitted were to be subjected; or of the perplexing nature of the official control now exercised over our public buildings? Mr. Street had passed the ordeal of legal criticism, for on the authority of a leading legal journal "his plans and arrangements leave nothing to be desired." He had escaped "Scylla" in the person of that awful and much-dreaded Edile, Mr. Ayrton, only to be dragged into Charybdis and engulfed by the Chancellor of the Exchequer, Mr. Lowe; and as though that fate was not enough to crush Mr. Street, he was now threatened with that most dangerous of all tribunals, "Parliament," a mixed jury of 658 members, of whom probably six might know something of the matter on which they were supposed to pass judgment! (Hear.) And then it was suggested that the "wheel of fortune" should have one more turn, and a new competition be originated, to go through the same protracted and useless routine! (Laughter.) If such a proposal should be decided on, which he could scarcely believe, he trusted that the profession would not have sunk so low, or be so lost to a sense of its own honour, as to permit any member of it to enter on such a competition. (Applause.) He was well aware that this was said to be a land of liberty, where every one (qualified or not) enjoyed the presumptive—not to say presumptuous—right to express his opinion on any given subject, and he could therefore understand that men like Sir Edward Cust, Mr. Denison, Mr. Cavendish Bentinck, and Mr. Alfred Seymour, who were supposed to have given consideration to the subject of architecture, and Mr. Sidney Smirke, who was known to have done so, should take an interest in the matter and express themselves freely, if not wisely. And he could even understand such professional criticism as Mr. Ferguson passed on Mr. Street's proposal to vault his great hall, and on his elevations, though he much deplored its tone and severity. He (Mr. Wyatt) claimed the right personally to criticise Mr. Street's design, and to express regret that the Straud front was so broken up into various and perhaps disjointed parts, so long only as he did so without personality or violence; but what could justify from one architect (in speaking of the works of others of his own profession) such a tirade of self-sufficient abuse as that contained in Mr. Welby Pugin's letter of the 9th

September, in speaking of Mr. Currey, Mr. Scott, and Mr. Street? Where was the *esprit du corps* of our profession when such flagrant violations of etiquette were tolerated? The President then gave a brief *résumé* of the various important works now in progress or completed in the United Kingdom, and after alluding to the catastrophes at Paris and Chicago, concluded by reviewing the progress of architecture in Germany. On this topic he said that knowing his brother (Sir Digby Wyatt) was about to have a holiday and make a tour in Germany and Austria, and having confidence in his quick observant eye, he requested him to make some memoranda of the important public architectural works in progress which he might see. His brother told him that during the past year the anxieties and expenses connected with a state of war had almost entirely checked the undertaking of new works in Berlin; but it had seen the completion in that city of some structures of considerable interest, particularly in the technicalities of building. The new "Rath-haus," or Town Hall, was a structure upon which vast sums had been lavished, and an effort had evidently been made to rival the magnificence of the now destroyed Hotel de Ville at Paris. The general effect was not commensurate with the expenditure; but the beauty of the oak carving, of the terra cotta, of the ironwork, and of the ornamental floors generally, reflected the highest credit upon the present condition of the building trade in Prussia. What was perhaps most to be admired in the Town Hall at Berlin was the magnificence of the carved wainscot ceiling in the hall where the magistrates held their meetings. What was most to be regretted was the sombreness of many parts of the interior, and the vulgarity of the stained glass, which added to the gloom. Although not so ambitious, the new Finance Ministry building was much more satisfactory. Its façade, which recalled some of the Pisan and Florentine buildings of the end of the fifteenth century, displayed a great propriety of parts and much elegant detail. The new Miut, which was an immense structure, somewhat resembled the Ministry of Finance in its style, but was less congruous in bringing together its leading features. Much regularity and almost severity of general style was marred by eccentricities here and there tending almost to caricature. There were certain great consoles with figures of miners, executed in a quasi-romantic style, which quite distracted the attention of the observer from all the adjoining architectural detail. They were neither strictly ornamental nor functional, and they furnished an illustration of the bad effect of that struggle to retain a sort of Mediaeval comicality which not unfrequently disfigured otherwise clever designs in England. These buildings were all of brick and terra-cotta, and manifested that there was no deterioration in Berlin in the use of such materials.

At Vienna the value of a year of peace showed itself in the completion of many architectural works of the highest merit. A more noble boulevard than that constructed upon the whole line of city defences could not be imagined. The magnificent "Franz Joseph" Caserne, with its great exercising-ground and its town gate opposite to its central mass, was certainly the most skillfully designed barrack in the world; simple in its parts, these parts were so brought together and contrasted as to form a grand and effective composition, and it showed, in the hand of a truly accomplished architect, how much grandeur might be obtained in structures of the most utilitarian kind. The new Opera House was certainly about the handsomest Renaissance building in Europe, and was no less admirable in its external effect than well suited in every particular for its purpose. The "Votive Church," as a Gothic structure, was very elaborate, and beautifully executed. There was, however, a certain "cast-iron" hardness in its details; it was too florid, and illustrated the bad effects which the over-admiration the Germans had bestowed upon the open-work spires of Cologne Cathedral had occasionally led to in that country. As a general feature of the noble new street architecture of Vienna, there might be remarked the frequent use of external gilding and polychromy, sometimes obtained by actual painting, and more frequently by the contrast of variously-coloured terra-cottas and other materials. Many of these structures reflected the highest credit upon the Honorary and Corresponding Members of the Institute, Ferstel, Schmidt, and Hasenauer, all of Vienna. At Dresden the foundations for the magnificent structure which Professor Semper (Honorary Contributing Fellow) had designed to replace his *chef-d'œuvre*, which was destroyed by fire, were making slow but steady progress.

Professor KERR proposed and Mr. G. ARCHIBSON seconded a vote of thanks to the President for his address, and the proceedings terminated.

GRANITE AND ASPHALTE PAVEMENTS.

(Continued from page 336.)

GRANITE PAVEMENT, CHEAPSIDE.

THIS street was paved with new Aberdeen granite in 1829, the stones being 6in. by 9in., with wood in 1843, and again with granite in 1846 and 1847. It was again newly paved in 1861, partly with Port Nant and partly with Aberdeen granite, which was removed in October, 1870, when the Val de Travers compressed asphalt was laid in its place. Only once, therefore, since 1843 has a pavement been down so long as fifteen years, the average being much less.

An Aberdeen granite pavement of 3in. by 9in. stones might, however, under the present traffic, be made to last fifteen years in Cheapside, during which period small portions of new stone would have to be introduced from time to time when repairs were made; and it would be desirable to re-lay the entire surface twice, and absolutely necessary to re-lay it once, at which time a considerable quantity of new stone would have to be put in; some of that removed would be unfit to use again, and the remainder would, according to the custom already described, be re-worked and laid in other thoroughfares as occasion might require.

Taking the first cost at 16s. per square yard, estimating the repairs by past experience, taking one relay over the entire surface, and allowing for the value of the old stone when removed at the end of the last term, the total cost during the fifteen years would be £1 4s. 4½d., or 1s. 7½d. per square per annum. The traffic is about 11,900 vehicles daily in 24 hours.

GRANITE PAVEMENT, POULTRY.

The Poultry was laid with wood in 1841 and 1843, with granite partly in 1846 and partly in 1852, and throughout its length with new stone and granite trams in 1859; with cast iron pavement and Redman's iron trams partly in 1862 and partly in 1863; and in December, 1865, it was laid with new granite and Carey's iron tooth-edged trams, which pavement was taken up in October, 1870, having been down 4½ years, and being then in a bad condition, and it was replaced with the Val de Travers compressed asphalt. Since 1841, therefore, one pavement only has lasted as long as seven years, the average duration having been less.

The cost of the pavement in the Poultry during the last fifteen years has been very high, and higher than it otherwise might have been, owing to the various experiments made with the view of obtaining a more durable pavement. The whole of these experiments, it must be said, have failed, that laid with Carey's tooth-edged trams perhaps excepted, which was undoubtedly the most durable, as the trams prevented in a very large degree the formation of ruts, to which the Poultry pavement is subject.

A granite pavement of stones 3in. by 9in. might, nevertheless, I think, last seven or eight years, but provided only that, at the time when it could be most economically done, a general relay of the whole surface be made and a considerable quantity of new stone be then put in. Assuming a life of eight years with a first cost of 16s., the total cost during the term would be £1 2s. 4d., or 2s. 3½d. per square yard per annum.

The Poultry now has a traffic of about 9,600 vehicles in the twenty-four hours, and still affords one of the most severe tests to a pavement that can be found.

GRANITE PAVEMENT, OLD BROAD-STREET.

The pavement in Old Broad-street, recently removed, was formed of stones, 6in. wide and 9in. deep. For the last twenty years it has been repaired chiefly with similar stones taken from other streets. The traffic was small until the opening of the railway stations in Liverpool-street in October 1865, since which time it has increased and altered in its character. It is now about 2,600 carriages daily in twenty-four hours, and in many perhaps be further increased when the Great Eastern Railway Terminus is formed at Liverpool-street.

A pavement of stones, 3in. by 9in., might, under present conditions, last twenty years in this street, and possibly a little longer; the general repairs during the period would be small, as compared with the thoroughfares previously mentioned; and it would require during its life at least two entire relays, but would need less new stone at each relay than the other streets. Assuming a twenty years' life, the total cost would be about £1 0s. 11½d., or 1s. 0½d. per square yard per annum.

GRANITE PAVEMENT, MOORGATE-STREET.

Moorgate-street was laid in 1848, with an experimental pavement formed of different classes of stone, which was removed in 1864, having been then down sixteen years. The cost of the different specimens varied from 10s. 9d. to 17s. 0d. per square yard when new, and the repairs varied much also. The mean cost of the whole was 1s. 3½d. per square yard per annum during the sixteen years.

That laid in 1864, and now down, has cost proportionately more; but the repairs have been unusually heavy, and the stone has been badly worn by exceptional circumstances. The cost, therefore, cannot be taken as a basis for estimate.

A pavement in Moorgate-street, of Aberdeen granite, with stones 3in. by 9in. would, under present conditions, last, I think, fifteen years; requiring, as in other cases, at least one general relay, and the introduction of a certain quantity of new stone at that time. It is doubtful whether the stone would be so much worn when removed as it would be in Cheapside, and would, therefore, be more valuable, and the annual repairs would also be less; taking the first cost at 16s., and estimating as before, the expenditure during fifteen years would be £1 0s. 7d., or about 1s. 4½d. per square yard per annum.

The traffic which daily passes over Moorgate-street in twenty-four hours is about 7,400 vehicles, most of it quick, and some of it quick and heavy.

GRANITE PAVEMENT, LOMBARD-STREET.

The carriage-way of Lombard-street has been formed of wood for many years past. It has a daily traffic of about 2,600 vehicles in twenty-four hours, which is light in its character. Under its present conditions, a granite pavement would last there quite as long as in Broad-street, and the cost of repairs would be also about the same. I estimate the total cost for twenty years at £1 1s. 4½d., or about 1s. 0¾d. per square yard per annum.

COMPARATIVE COST OF GRANITE AND ASPHALTE PAVEMENTS.

A description of the various asphaltes has now been set before the committee, together with estimates of their cost, as well as the cost of stone pavements in the same streets, and comparison of the two kinds of pavement may be best made by reference to the accompanying tables.:-

TABLE 1.—GRANITE PAVEMENTS.				
Abstract showing the estimated cost per annum of granite pavements in some of the principal carriage-ways in the City of London.				
Situation.	Description of Pavement.	Estimated duration of pavement.	First cost per square yard.	
			s. d.	£ s. d.
Cheapside.....	Aberdeen Granite.	Years.	15	1 7½
	3" x 9"		16 0	1 4 4½
Poultry	Aberdeen Granite.	8	16 0	2 9½
	3" x 9"		16 0	1 2 4
Old Broad-street..	Aberdeen Granite.	20	16 0	1 0 1½
	3" x 9"		16 0	1 0 1½
Moorgate-street ..	Aberdeen Granite.	15	16 0	1 0 7
	3" x 9"		16 0	1 0 7
Lombard-street ..	Aberdeen Granite.	20	16 0	1 1 4½
	3" x 9"		16 0	1 1 4½

No foundations are included in these estimates.

TABLE 2.—ASPHALTE PAVEMENTS.									
Abstract showing the agreed cost per annum of Asphalt pavements in some of the principal streets in the City of London.									
Situation.	Description of Asphalt.	Suppl. area.	Years to be maintained by Contractors.	First cost by per square yard.	Agreed cost of maintenance per square yard for the contract term.	Total cost of pavements during term of contract.		Average cost per square yard per annum.	
						£ s. d.	£ s. d.	£ s. d.	£ s. d.
Cheapside.....	Val de Travers Compressed	6466	17	0 16 3	{ 2 years free of charge 15 years at 1s. 6d. = 1 2 6	1 18 9	0 2 3½	0 2 3½	0 2 3½
Poultry	Ditto	1005	17	0 16 3	{ 2 years free 15 years at 1s. 6d. = 1 2 6	1 18 9	0 2 3½	0 2 3½	0 2 3½
Old Broad-street...	Ditto	3671	17	0 14 3	{ 2 years free 15 years at 9d. = 0 11 3	1 5 6	0 1 6	0 1 6	0 1 6
Moorgate-street ...	Ditto	about 1000	17	0 14 3	{ 2 years free 15 years at 9d. = 0 11 3	1 5 6	0 1 6	0 1 6	0 1 6
Moorgate-street ...	Barnett's Iron Liquid	about 1000	18*	0 10 6	{ 3 years free 15 years at 1s. 4½d. = 1 0 7	1 11 1	0 1 8½	0 1 8½	0 1 8½
Moorgate-street ...	Limmer Liquid	about 1000	17	0 13 4	{ 2 years free 15 years at 9d. = 0 11 3	1 4 7	0 1 2½	0 1 2½	0 1 2½
Lombard-street ...	Ditto	1653	17	0 13 4	{ 2 years free 15 years at 9d. = 0 11 3	1 4 7	0 1 2½	0 1 2½	0 1 2½
George-yard.....	Val de Travers Liquid ...	232	10	0 10 3	{ 10 years free	1 4 7	0 1 5½	0 1 5½	0 1 5½

No foundations are included in these estimates.
* Mr. Barnett's agreement with the Commission extends to three years only.

TABLE 4.									
Showing comparative cost of granite and asphalt carriage-way pavements in some of the principal streets in the City of London, the asphalt being assumed to last four years, without repairs, beyond the periods of maintenance contracted for.									
Situation.	Granite.		Asphalt.		Difference of cost per yard.		Remarks.		
	Estimated duration of pavement.	Total cost per annum.	Estimated duration of pavement.	Total cost per annum.	s. d.	s. d.			
							Years.	s. d.	Years.
Cheapside.....	15	1 7½	21	1 10	0 2½	Increased cost of Asphalt (Val de Travers).			
Poultry	8	2 9½	21	1 10	0 11½	Decreased ditto ditto.			
Old Broad-street...	20	1 0½	21	1 2½	0 2	Decreased ditto ditto.			
Moorgate-street ...	15	1 4½	{ 22	1 2	0 2½	Decreased ditto (Barnett's).			
			{ 21	1 2	0 2½	Decreased ditto (Limmer).			
Lombard-street ...	20	1 0¾	21	1 2	0 1½	Increased ditto ditto.			

Table 4 shows that upon an average of main streets there would not be a material difference in cost between granite and asphalt, but the four years' duration of the asphalt without repair at the expiration of the contract term is an assumption only.

At Paris asphalt is considered to be more expensive than granite; but its use nevertheless was being largely extended when the war broke out.

ADVANTAGES OF ASPHALTE AS COMPARED WITH STONE PAVEMENTS.

I now proceed to that part of my reference which refers to the "relative advantages of the two classes of pavement." This was reported upon at some length by me in July, 1870, but much experience having been since gained, it is desirable to resume the consideration under the various heads into which it naturally falls, viz.:—1. Convenience; 2. Safety; 3. Cleansing; 4. Construction and repair; 5. Durability.

Comparison of value can, however, only be made between granite and the compressed asphalt of the Val de Travers, because experience in this country may be said to be confined at present to that material; the liquid asphaltes of the Limmer Company and of Mr. Barnett having been laid as yet but recently and in limited extent.

Therefore, in the following remarks it is to be understood that, unless other asphaltes are specially named, the compressed asphalt from the Val de Travers is that referred to.

CONVENIENCE.

The surface of the asphalt being smooth and without joints, the labour in the traction of vehicles is much reduced; in fact, the wheels run almost as easily and as smoothly over it as they do on a street tramway, and, consequently, carriages are less jolted, and the fatigue to passengers and to horses is diminished.

M. Leon Malo, a French engineer, who has written upon the subject, estimates that if all Paris were paved with the Val de Travers compressed asphalt, the saving there in wear and tear to horses and carriages would be £340,000 per annum; such calculations are difficult to make convincing, even with the most honest intention, and the sum named by M. Malo seems very large; but there can be no doubt that the saving would be considerable, and the reduction in wear to horses and carriages in London, if it were largely paved with asphalt (there are reasons why it cannot be entirely paved with it) would represent a large sum of money annually.

The asphalt is much less noisy under traffic than granite, but not so noiseless as a wooden pavement, and it is this absence of noise which is the principal inducement to use it. If even the main thoroughfares only were laid with it, the comfort to all passing through them, and to the inhabitants in them, would be very great. So many persons, however, are now acquainted with the pavements in Cheapside, the Poultry, and other places in the City, that it is unnecessary to advert to this point further, inasmuch as the convenience and comfort which asphalt gives must be admitted by all.

From close observation, I think that the asphalt is not so noiseless after it has been down two or three months as it is when first laid; and that this is attributable to its compression and solidification under the traffic.

The asphalt being impervious to moisture, water falling upon it either runs off or is evaporated quickly. During the past winter the thoroughfares paved with it were for days together the only dry carriage-ways in the City; for after the rain, the moisture remains in the dirt between the joints of granite pavements, causing them under traffic to be both wet and muddy, whereas the asphalt, if clean, is perfectly dry shortly after the rain has ceased; and this causes the footways to be cleaner than where the carriage-ways are of granite, for much of the mud upon footways comes from the carriage-ways. No process can clean granite pavements of the dirt which elings to the joints, except washing them, a process only applicable at early hours in the morning, or at night.

On account of its smoothness many foot passengers walk upon the asphalt, where the carriage traffic admits of their doing so, but they rarely walk upon granite pavements.

Other advantages which it possesses will be found under the respective heads of cleansing, formation, and repair.

SAFETY.

This depends at times largely upon the condition of the surface in respect of cleanliness.

In ordinary dry weather, or when it is very hot and dry, or very cold and dry, it is less slippery than granite.

If heavy rain falls, it makes the pavement clean at once, and it dries up without causing slipperiness, nor is it very slippery during heavy rains, although more so than when dry.

Two falls of snow occurred last winter, and it was upon those occasions found to be not more slippery than granite.

On one occasion a sharp frost ensued after rain, and the granite pavements in the City became slippery, but the asphalt dried quickly and was not slippery at all.

I have in Paris, however, seen it when hard frost ensued immediately after rain, and it was then exceedingly slippery; and this was remedied by slightly strewing the surface with sand. Such occasions are not frequent in this country, and when they occur, the remedy must be by a similar process. The smooth macadamised roads in the metropolis on such occasions are quite as slippery as asphalt would be.

Immediately after slight rainfalls, or just before dryness ensues after rain, the asphalt, if not strictly clean, is more slippery than granite. The time this slipperiness lasts depends upon the weather and the state of cleanliness of the surface, but the asphalt, being impervious to moisture, dries so rapidly if clean that the condition does not usually last long. I noticed during the past eight months that it rarely lasted more than a quarter of an hour, but that during that time it was everywhere undoubtedly much more slippery than granite.

Upon such occasions, strewing it slightly with sand at once remedies the evil, and for this purpose

the street orderlies now have always' sand at hand. Washing it, if practicable, would have the same effect.

If, however, a granite pavement be worn smooth and be dirty, then, under slight rain, the difference in respect of slipperiness between asphalt and granite is less than if both are tolerably clean.

At Paris it is thought that the mud formed upon asphalt is not so greasy as that formed upon granite, which combines with it finely-commingled particles of the stone, and it is probable that such is the case—for the mud dragged on to Cheapside and the Poultry from the adjacent granite in moist weather appears to make the asphalt at those places more slippery than at other parts.

Indeed, the asphalt pavements now laid in the City suffer much from the mud from other parts; thus, after rain, when the remainder of the surface is perfectly dry, a line of mud half the width of the road may be usually seen on the south side of the Poultry, extending from the Mansion House to Bucklersbury, and on the northern side of Cheapside, from Newgate-street to Foster-lane, the mud having been dragged on to it from the adjacent granite. Small pieces, such as those in the Old Bailey and Threadneedle-street, therefore, suffer from it more, proportionately, than greater lengths and larger areas.

During dry, or wet weather, scarcely any horses fall upon the asphalt, but when slipperiness suddenly ensues, all those which fall do so at about the same time, and thus attract much more attention than they would if the accidents were more uniformly distributed throughout the day, as they are upon granite or other road surfaces. Asphalt, moreover, being at present a novelty here, more notice is taken of one horse falling upon it, than of fifty horses falling upon granite; for accidents upon granite are regarded as inevitable, and excite little or no remark.

The slipperiness of a pavement must not, however, be judged of by such exceptional conditions and times, but by averages including considerable periods of time and all seasons of the year. No observations of much extent or value have, I believe, been made of the horses that fell in any of the streets which were, until recently, paved with granite; and judgment upon this point must therefore be largely formed from the opinion of those having opportunities and fitness, for making observations.

The question being one of vital importance, and requiring the fullest consideration before asphalt pavements are much extended, I tried to obtain the best and most reliable information upon the point; and Cheapside and the Poultry having so large a traffic, and the slipperiness and its consequences being more obvious there than in other thoroughfares, information has been mainly sought with regard to those two streets.

In November, 1870, the asphalt having been then down twenty-seven days, of which eleven days were more or less wet, I made inquiries of the secretary of the London General Omnibus Company, the inspector of pavements, the superintendent of street cleansing, and of the city police, all of whom, from their position, have special opportunities for observation and forming opinion, and their opinions, as given to me in writing, were briefly as follows:—

Mr. Church, Secretary to the London General Omnibus Company, after taking the opinions of the drivers of the company, and considering the actual facts which had come under his observation, was of opinion that no more horses fell upon the asphalt in Cheapside and the Poultry than fell when the granite pavement was there.

The Inspector of Pavements was of opinion that fewer horses fell upon the asphalt than upon the granite, in consequence of the greater care taken by the drivers, and the slower pace at which the traffic passes over it when damp.

The Superintendent of Street Cleansing, from constant personal observation, and from the evidence gathered by him from the street orderlies, who are all day long in the street, was of opinion that, upon the average, no more horses fell than upon the granite, and his impression was that fewer fell.

The police were of opinion that when the carriage way was dry or very wet the traffic passed through it well, but that, when slightly damp, it was somewhat impeded, the drivers seeming to fear that the horses might fall, and therefore driving more slowly; but the police did not think that more horses upon the average fell than upon the former granite pavement.

The general opinion of all consulted at that time, therefore, was that perhaps fewer, but certainly not more, horses fell upon the asphalt than upon the granite.

(To be concluded.)

Building Intelligence.

CHURCHES AND CHAPELS.

BEAWORTHY.—The parish church of Beaworthy, Devon, was reopened on Hallowmas Eve. The total cost of the restoration is about £480. The Church is Early English in style, and consists of tower, entrance-porch, nave, and chancel. It is built of a grayish-coloured stone, and will accommodate about 150 worshippers. The architect of the building is Mr. S. Hooper, of Hatherleigh, and the contractors were Messrs. Horne & Saunders for the woodwork, and Messrs. Ward & Chapman for the masonry.

BESWICK.—The Primate of England consecrated the new church of S. Margaret, Beswick, near Beverley, on Saturday. The building is of Early Decorated character, formed of nave and chancel, a vestry on the north side, and a good-sized porch on the south side. The interior is lined with ashlar. The whole of the seats are made of pitch pine, varnished. The whole of the floor is laid with Minton's encaustic tiles. The walls of the exterior are faced with Bradford wall stones, beaded and pitch-faced. The whole of the dressings are of Bath stone. A small tower rises above the roof, and contains one bell.

CHEETHAM HILL.—The foundation-stone of a new Wesleyan chapel, which is about to be erected on Queen's-road close to Cheetham Hill, Manchester, was laid on Saturday. The building will be in the Early Gothic style, with parapet facings and Hollington stone dressings. The interior dimensions of the chapel will be—length, 104ft.; width, 47ft. It will have galleries all round. The sitting accommodation will be sufficient for 850 persons. In addition to the chapel, the building will comprise a lecture-room, 34ft. by 25ft., four class-rooms, vestries, and chapel-keeper's house. The architects are Messrs. Clegg & Knowles, of Manchester, and Mr. Foggett, of Cheetham, is the builder. The present contract for the building amounts to £5,100, but the cost of the building and site is estimated at £7,500 altogether.

CLAPTON PARK.—On Thursday week the Bishop of London consecrated the new church of All Saints, Clapton Park, built from a design by Mr. Dollman. It is in the Early English style, faced externally with Kentish rag, and internally with red brick, banded black, with moulded stone arches and pillars. The east and west windows are deserving of special attention, from their size and design, as is also the reredos, representing the Crucifixion, and carved by Mr. Earp, of Lambeth. The pulpit is of alabaster and stone, and the font has a magnificent white marble basin. The church is meant to seat 800 people, but it will really accommodate nearly 1,000. When complete it will have cost about £10,000, inclusive of the site.

HATCHAM PARK.—On All Saints' Day the Church of All Saints, Hatcham Park, was consecrated. The building is of Kentish rag, faced with Bath stone, and provides accommodation for 850 worshippers.

LONG SUTTON, LINCOLNSHIRE.—The Congregational chapel has been reopened after having been almost entirely rebuilt. The style of architecture is Romanesque and the material of the walling Whittlesea brick and Ancaster stone. The architect was Mr. Tait, of Leicester, and the contractors for the builder's work Mr. Chappel, of Holbeach, and for the heating Messrs. Blake & Co., Coventry.

MATLOCK.—The parish church of Matlock, after undergoing a thorough restoration, was reopened for public worship on Thursday week by Bishop Hobhouse. The church, which is dedicated to S. Giles, contains sitting accommodation for 500 persons in open benches, and consists of nave, north aisle, chancel, organ chamber, and a transept on the north side. It is built of stone throughout the interior, having a boarded surface, and the exterior hammer-dressed stone with cleansed dressings. The nave is divided by three arches on each side with stone octagonal piers, having moulded caps and bases and cleansed stone arches. At the east end of the north aisle is a transept. The roofs are trussed rafters, open timbered roofs, covered with wrought boarding. The whole of the interior woodwork is stained and varnished. The church is heated with hot water by Messrs. Crump, of Derby, at a cost of £120. The lighting is by brackets, &c., to the nave and aisles, and by standards to the chancel, all relieved in blue and gold. These have been supplied by Messrs. Hart, Son, Peard, & Co., of Wych-street, London. The total cost has been about £2,000. The contractors for the works were Messrs. Buxton & Sons, of Lea and Matlock Bath, for the woodwork; and Mr. A. Bridge, of Matlock, for the stonework. Mr. B. Wilson, of Derby, was the architect.

NINEBANKS.—The old church of Ninebanks, which is a chapelry in the parish of Allendale, and had become about two years ago so dilapidated that it required extensive repairs, has been reopened. It consists of a simple nave, 50ft. long and 17ft. 7in. wide, with apsidal end, north porch, with which is engaged a turret and vestry. The style adopted is Early English, with lancet windows. The total outlay will be about £810. The work has been performed by Messrs. Adamson, of Eggleston, near Barnard Castle; Mr. F. R. N. Haswell, of North Shields, was the architect.

PIMLICO.—On the vigil of All Saints', the Archdeacon of London (Bishop Claughton) consecrated the new church of All Saints', Pimlico, standing on the site of a temporary iron church. The church, built from designs by Mr. Cundy, is a handsome structure of red brick, relieved by white, and the internal arrangements are very correct. The chancel is well raised, the nave is bold and lofty, and the marble pillars dividing it from the side aisles hardly interfere with the general appearance of width.

BUILDINGS.

BARWELL.—New schools are now being erected at Barwell, Leicestershire. The memorial-stone was laid on the 19th ult. by Albert Pell, Esq., M.P. The buildings will be of brick with stone dressings. Accommodation will be provided for 230 children. The architect is Mr. F. B. Osborn, of Birmingham, and the contractor is Mr. J. F. Simpson, of Leicester.

BIRKENHEAD.—The new building for the Birkenhead School Company, Limited, is completed. It is in the Tudor-Gothic style, as seen at Oxford colleges, and is constructed of white Stourton stone and red bricks from Ruabon. The principal feature is the school-room, a hall, which is almost detached, and is lighted by six lofty windows, with stone mullions and tracery, on each side. The schools were originally designed by the late Mr. Lucey, who died before they were commenced, and have been carried out by Mr. Walter Scott. The cost of the building has been about £4,000. Messrs. Haigh & Co., of Liverpool, were the builders.

S. JAMES'S THEATRE.—The alterations to this theatre for M. Raphael Felix have been carried out under the direction of Mr. Walter Emden, architect, of 8, Adam-street, Strand. The dress circle has been transformed into decorated private boxes, which give the house an elegant appearance.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 21, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

RECEIVED.—J. B.—C. B.—J. H.—A. C.—A. & H.—W. E. B.—J. P. S.—H. St. J.—J. H.—E. S.—C. W. C.—W. B.—L. & Co.—Welfare.—E. S.—Stonemason.—J. G., Jun.

E. L.—See our article on International Exhibitions.

W. L.—The Law Courts drawings are not public property. W. M. POTTER.—The photo and plan came to hand all right. Had it been a line drawing, instead of a photo, so that we could have photo-lithographed it, we would promise to give it.

Correspondence.

THE REBUILDING OF CHICAGO.

To the Editor of the BUILDING NEWS.

SIR,—As the late disastrous fire in Chicago appears to have been in a great measure owing to the large number of wooden dwellings, it is very improbable that in rebuilding the same material will be much used, and at the same time a cheap and rapid method of building will be necessary. I venture to suggest that, providing cement can be obtained there, that concrete would meet the exigencies of the case. The success this material has met with in England (not only because of its economy and durability compared with the ordinary brick-and-mortar structures, but as well on account of the rapidity with which buildings can be erected) has often surprised me that it should have been thus overlooked by our American friends, so eager to take advantage of any improvement. I think that had some such material as concrete been used for the building of the cities of the West, we should have heard less of such disastrous fires as have prevailed of late in America.—I am, &c., C. W. C.

EMBRYO ARCHITECTS.

SIR,—I can consider "J. J.'s" letter on this subject in last week's BUILDING NEWS to be nothing less than a direct misrepresentation of my statements on the subject of "Embryo Architects." He says that I seem to think that the sole mission of an architectural draughtsman is the outlining of Classical elevations. I instance a Classical elevation because it generally demanded more care than a Gothic one, and did not give him any just grounds for assuming that I deprecated colour. We all know that it is absolutely necessary, particularly in working drawings, and I did not call into question Mr. Street's artistic powers; it was his particular mode of representing plain surfaces in his etchings that I did not agree with, and I purposely said by lines at different angles, or diagonally, if this is intelligible to "J. J."; and as to "imitation," in speaking of the designing powers of young architects, I considered that the source from whence the designs were derived was often too evident, and advocated more originality, in which "J. J." quite agrees, but with the notion that he is writing something original. It is positively annoying to have to respond to the comments of such a careless reader as "J. J."; for an understanding such as his one should write a column, where to other people a sentence would be sufficient.—I am, &c., W. W.

POSTAL REGULATIONS.

SIR,—I herewith beg to forward you a letter I wrote to the Postmaster-General, and the reply. I forward you these in the hope that you will set on foot a petition that will compel the Post Office authorities to restore the advantages of which we have so recently been deprived.—I am, &c.,

E. WELBY PUGIN.

Victoria House, Victoria-street, Westminster,
Nov. 6, 1871.

(Copy.)

TO THE POSTMASTER-GENERAL.

SIR,—The new regulations regarding the length of drawings allowed to be sent by post nullifies to us architects every advantage accorded by the new regulations. Most of our drawings are something under two feet in length, but all are above eighteen inches. Under the new regulation we are compelled to forward them by rail, often-times at six times the cost of the old postage. This is coupled with great inconvenience and great delay. Considering the old regulations have been in force for the last twenty years, and were found workable, it is simply monstrous that, under the new and reformed regulations, we are driven back to the inconveniences of our grandfathers. What is the meaning of it? We can all understand an improvement, but this retrogression is incomprehensible. Begging the favour of a reply at your earliest convenience.—I have the honour to remain, sir, your obedient servant,

(Signed) E. WELBY PUGIN.

Victoria House, Victoria-street, Westminster,
Oct. 30, 1871.

(Copy.)

SIR,—Referring to your letter of the 30th ult., I beg leave to acquaint you that before the recent regulation as to the limit of length for book-packets was laid down, the matter was carefully considered, and I regret that there does not appear to be any sufficient ground for departing from the decision arrived at, and reverting to the former limit of length as you desire.—I am, &c., (Signed) G. HARDY,

For the Secretary.

General Post Office, London,
Nov. 3, 1871.

[In our opinion, a petition is a cumbersome and uncertain way to rectify the evil complained of, as no doubt the petitioners would get a reply similar to that received by Mr. Pugin. Officials, by some extraordinary twist of vision, look upon the British public as an appendage to their offices. As a rule, they are pre-eminently inaccessible to reason, but very sensitive to chaff or satire, or remonstrance in the House of Commons. Let some M.P. take up the question in half a dozen well-timed and well-turned sentences in the House of Commons, and more will be done than could be achieved by a dozen petitions. We are sorry we are not there to do the work.—ED.]

PLANNING HOUSES.

SIR,—I have reason to believe that the "Sketch-book" competition was the means of exercising in the minds of numbers of our young men an interest and love for Mediaeval buildings in this country which they did not before possess, and induced many, who had never before attempted, to sketch interest-

ing works of that kind; and although many of those sketches fell below the ordinary standard of excellence, yet, as a rule, they were received by subscribers generally as interesting and instructive drawings of works which had not hitherto received the publicity which they deserved. That competition, therefore, was of practical interest to the readers of the BUILDING NEWS, but more especially beneficial to the authors of the sketches themselves.

I hail, therefore, with gladness the prospect of your starting a fresh competition in a class of design which is likely to be of practical value and benefit to a large number of practitioners engaged in domestic architecture; and unless the members of our profession are blinded by the vanity of their self-imposed merit, we shall not be likely to see repeated the errors which some three weeks ago we took the liberty to expose.

In contradistinction, however, to the statement of a correspondent last week, I would venture to suggest that it is scarcely within the province of the editor of this paper to state the exact number of rooms which a gentleman may require in his residence. It is more especially a matter for the consideration of the competitors. Fearing, however, the excess which many would be constrained to run to in the matters of accommodation and cost, I would submit for consideration the propriety of confining the total area of the ground floor to 5,000 superficial feet. We remember a "Design for a Mansion," exhibited at one of the exhibitions in Conduit-street, elaborated beyond conception, and the cost set down at £80,000. Drawings of that kind are valueless to everybody. A thoroughly sound practical setting-forth of that class of residences which are rapidly springing up throughout the country is more particularly wanted—buildings of ordinary capacity and pretensions, of which hundreds are erected yearly to every one of those gorgeous mansions suited to the loftier grades of society. And while the pre-eminent importance of a well-arranged plan is always to be acknowledged, we should not, at the same time, be oblivious to external appearances. It is quite possible for things which fit upon plan to spoil the external beauty of a design, which neither architect nor client would allow. Therefore, undoubtedly, the best method of testing the proper fitness of things internal and external, as well as to give an idea of cost, is for each competitor (at his option) to send a perspective view, so that three or four of the highest order of merit might be reproduced in the BUILDING NEWS in honour of the architect. That would be a further inducement for persons of real talent to exhibit it, and I am sure would be received with gladness by the general reader in preference to some of the designs which have only too sure a prospect of being realised.—I am, &c., H.

[We should be glad to hear any other opinions which may be offered before the conditions of the competition be stated.—ED. B.N.]

SHRINE OF EDWARD THE CONFESSOR.

SIR,—In the remarks on my works in the Architectural Association Exhibition, contained in your last issue, the authority is questioned for the gilt tabernacle which surmounts the mosaic portion of my restoration of the Shrine of Edward the Confessor in Westminster Abbey. Mr. Scott, in his "Gleanings," gives a fac-simile of an illustration in a MSS. life of St. Edward, preserved in Cambridge. The form of the "chasse" and the disposition of the figures of St. Edward and St. John as the mysterious pilgrim are taken from this source.—I am, &c.,

THOMAS HENRY LONGFIELD.

19, Harcourt-street, Dublin.

Intercommunication.

QUESTIONS.

[2371].—**Patches on Drawings.**—Will some of your artistic correspondents kindly assist me out of this little difficulty? "M. R." is doing a large crayon drawing, and all is completed excepting the background. On several parts of the paper (which is not crayon paper) there are small, almost imperceptible greasy spots which will not receive the crayon, an unpleasant appearance being the consequence. Is there any way of removing these patches?—M. R.

[2372].—**Architect's Charges for Journeys.**—Would any one be good enough to inform me what I am fairly entitled to charge for journeys while professionally engaged in superintending a work at the distance of about 11 miles from town, each journey occupying half a day? My client contends that I have no right to charge for journeys at all, but I have reason to think that an opinion through your valuable journal would settle the question amicably.—VITRUVIUS.

[2373].—**Pointed Gothic Vaulting Ribs.**—What book besides Viollet-le-Duc's gives the practical setting out of the above?—X.

[2374].—**Measuring Brickwork.**—Will any of your contributors kindly supply me with information as to the most approved method of measuring chimney-breasts and shafts above roof for labour only; and also for materials and labour?—A NORTH COUNTRYMAN.

[2375].—**Wrought Iron Ties.**—"Wrought iron ties, &c., to be dipped in boiled linseed oil whilst hot." Which is correct, to make the iron hot or the oil hot?—RUST.

REPLIES.

[2357].—**Scientific Construction.**—A T iron is stronger placed this way Γ than the other T. Both Mr. Fairbairn and Mr. Hodgkinson made some careful experiments on this subject, and the result was that the proportion in favour of the beam in the first-mentioned position was to that in the other as 10 : 7. In actual practice, however, it is not always possible to place the beam in the most favourable position so far as strength is concerned, more especially as the other offers superior facilities for fastening other pieces of iron to it.—CRUCE.

[2358].—**Carpenter and Joiners' Improvement Society.**—The Carpenter and Joiners' Association mentioned in my last letter is proposed to be founded in the town of Haddington, N.B. Would be glad to have the benefit of "Architect's" information.—J. W. H.

[2359].—**A Legal Question.**—Most certainly B. would be entitled to compensation for any damage inflicted upon him by the agency of A. The great legal maxim respecting the exercise of one man's right at the expense of his neighbour, is "Sic utere tuo, ut alienum non lidas," which may be freely translated "Use your own, but don't abuse your neighbour's."—LEX.

[2361].—**Scales.**—Rub some Indian-ink all over the edges of the scales, and then wash it quickly in water. The water will take off the ink on the surface, but not affect the portions lying in the cuts making the divisions.—DRAUGHTSMAN.

[2363].—**Cutting Timber.**—I think "S.S." (query 2367), will find the following method answer his purpose: Of course the timber must be squared first, then take 7-24ths of the width, and prick, from the edges which will be the points to line to. 7-24ths of any width can easily be found by the following simple method: Place one end of a foot rule on one edge of the piece of squared timber, then bring the rule round until the other end touches the opposite edge of timber, make a point at 3 1/2 in., which is 7-24ths of a foot. If the piece exceeds 12 in. in width, open the rule to the 24 in., and make a point at 7 in., as of course that is 7-24ths of two feet.—FRANK CHESSELL.

LEGAL INTELLIGENCE.

COMPENSATION CASE.—**VICKERS v. METROPOLITAN RAILWAY COMPANY.**—On Monday last, at the Lord Mayor's Court, Guildhall, the case of Vickers v. the Metropolitan Railway Company came before the Deputy Recorder (Mr. T. Chambers, Q.C., M.P.), and a special jury, and in it was involved a claim of £28,964 8s. 4d. made by Messrs. Vickers & Co., distillers, against the Metropolitan Railway Company for reconstruction of their premises at Aldersgate-street, rendered necessary by certain works carried out by the railway company in connection with their Finsbury extension. Mr. Hawkins, Q.C., and Mr. Philbrick appeared for Messrs. Vickers, and the Metropolitan Railway Company were represented by Mr. H. Lloyd, Q.C., and Mr. Holway. The jury having viewed the premises in Aldersgate-street, there was a long consultation with a view to a settlement. Eventually, a verdict by consent was taken for the amount claimed, subject to the decision of arbitrators to be appointed.

BUILDING A MANSION.—The Master of the Rolls was occupied on Friday with a suit in which the defendants were Mr. Dick, M.P. for Wicklow, and Mr. William White, the architect, of Wimpole-street; and the suit arose out of a contract entered into by the plaintiff, Mr. Kimberley, who is a builder at Banbury, to erect a mansion for Mr. Dick at Homewood, in the county of Wicklow. It appeared that in the beginning of 1866 Mr. Dick decided on building the mansion in question. He consulted Mr. White, who prepared plans and specifications, from which he considered that a mansion could be built at a cost not exceeding £15,000, including everything, and he gave a guarantee to that effect. The plaintiff, without having, as he alleged, sufficient time to work out the quantities, entered into a contract for the execution of the work at £13,600. He soon, as he alleged, discovered that the actual quantities were greatly in excess of those taken out by Mr. White, upon the footing of which he made his tender, and on this and other grounds he filed his bill praying a declaration that, in addition to the contract price, he was entitled to be paid by measurement and value for all quantities of work actually executed by him beyond the quantities included in the original estimate. Lord Romilly decided in the plaintiff's favour, and directed an account of all works to be taken.

Our Office Table.

THE TIMBER OF NEW ZEALAND.—We have more than once directed attention to the great timber resources of New Zealand. *Nature*, in its last number, alludes to the subject as follows:—"The valuable timber so abundant in the North Island of New Zealand is deserving of a better fate than to be cut down wholesale and used as firewood. The rimu, or red pine, is most valuable for furniture and all ornamental work; the matai, or black pine, is more brittle and heavy than the other, but will take a most beautiful polish; whilst the totara, another so-called pine (for they are none of them *Coniferae*), is easily worked both green and dry. There is also the rata, 'that wonderful vegetable production forming itself out of numberless vines, which first receive their support from some full-grown tree, then enclose it in a deadly embrace, and gradually expel the remains of their foster parent as their own growing demands for space require to be satisfied, then finally uniting themselves form a solid tree, with all the characteristics of bark, sap and heart, roots, trunk, and branch.' This rata is almost the toughest wood known, and is used in many places for the cogs of wheels, &c. Besides these there are many others, especially the makia, which when thoroughly dry would turn or break the edge of the best axe ever produced in Sheffield, which are now only cut down for firewood as occasion requires.

INSTITUTION OF SURVEYORS.—The first ordinary general meeting of the session will be held on Monday, November 13th 1871, when the President, Mr. Richard Hall, will open the session with an address. The chair to be taken at eight o'clock.

OXFORD SCHOOL OF SCIENCE AND ART.—The annual public meeting for the distribution of prizes to the successful science and art students in the Oxford School of Science and Art was held on Tuesday week in the Town Hall. The very Rev. the Vice-Chancellor (Dr. Liddell, dean of Christ Church) presided. The Chairman congratulated the Art School on the great advantages which were opening before it in consequence of the establishment, by Professor Ruskin, of an enlarged system of art training within the Taylor Buildings. With princely generosity Mr. Ruskin offered £5,000, for the endowment of the master, and would provide all necessary drawings, models, casts, &c. The fund was placed in the hands of Dr. Acland and himself, to be bestowed hereafter according to rules and conditions to be drawn up. The unfortunate illness of the Slade Professor of Art had caused delay, but if the students would have a little patience they would find themselves possessed of great advantages. He congratulated the students in both departments upon their proficiency. Dr. Acland, in the course of an able address, congratulated Oxford on the progress which had been made in art and science, and in the views taken by the University in relation to that teaching. When, 25 years ago, he first gave a scientific lecture in this hall, he was told that if he presumed to mix up science with the citizens of Oxford, he would fail there as a professional man. Now he found himself on the same platform with the Vice-Chancellor, advocating the same cause. This was progress worthy of the quarter of a century, and progress of which they might well be proud. Other speakers followed, and the prizes were distributed.

PROPOSED TRAVELLING STUDENTSHIP IN CONNECTION WITH THE ARCHITECTURAL ASSOCIATION.—We hear that it is proposed to establish a travelling Studentship, of not less than £50 per annum, in connection with the Architectural Association, by means of subscription among the members. The Studentship will be confined to members only and will be competed for annually. We understand that one-third of the sum necessary for two years has been subscribed.

ST. ANDREW'S STREET, HOLBORN.—This new street and its approaches are now virtually completed, and, we suppose, will shortly be thrown open for traffic. The street runs in a south-easterly direction from Holborn Circus (just by S. Andrew's church) to the bottom of Farringdon-street (Ludgate Circus). About one half of the northern part of Shoe-lane (greatly widened and improved by pulling down a part of Farringdon Market) is utilised in the line of route, but it is to be regretted that the Corporation has been unable just at present to gain possession of Bangor House (Messrs. Kronheim's), which forms an ugly and awkward projection at the point of junction of the new street with the northern part of Shoe-lane. Proceeding in a south-easterly direction the new street crosses the top of Stonecutter-street, leaving the southern half of Shoe-lane

on its right, and runs in a straight line to Ludgate Circus. The gradients of Shoe-lane, Stonecutter-street, and Little New-street have been altered and slightly improved. The new street will complete the Holborn Valley Improvement scheme, and will relieve Shoe-lane, Fetter-lane, Chancery-lane, and Fleet-street of a great deal of traffic from Blackfriars to Holborn.

WORKING MEN AND BUILDING SOCIETIES.—Thirteen thousand houses in Birmingham, according to *Labour and Unity*, belong to working men. There are streets more than a mile long, in which absolutely every house belongs to the working-classes, and which are the healthiest districts in the town.

THE PROPOSED MEMORIAL OF "GREYFRIARS' BOBBY" AT EDINBURGH.—At the request of the Baroness Burdett Coutts, Mr. Brodie, R.S.A., has designed a memorial fountain, intended to commemorate the story of "Greyfriars' Bobby." The design provides for a structure 7ft. in height, to be worked out in a beautiful red granite. The base of the fountain is in the form of an octagonal basin, 3ft. in diameter, to be constructed of axed granite. This basin, standing as it does only a few inches above the ground, is intended to afford a drinking place for Bobby's canine relations. From its centre rises a cylindrical column of polished granite 2ft. high, and about 20in. in diameter, terminating at the top in a moulding on which rests the principal basin of the fountain. A second column, 18in. high and 12in. in diameter, rises out of the upper basin, and supports a bronze sitting figure of Bobby, which forms the apex of the structure. On the lower column will be placed a bronze plate, recording the well-ascertained facts of the dog's history, without the fictitious embellishments; while the upper column will bear, also in bronze, the arms of Baroness Coutts and those of the city of Edinburgh, together with suitable inscriptions.

ERRATUM.—The cost of the Orphanage of St. Joseph, as described on p. 304 a fortnight since, should have been 80,000 francs, and not 10,000.

CHIPS.

On Tuesday next a paper will be read at the Institution of Civil Engineers on "Pneumatic Discharge Tubes; the Circuit System," by Mr. Carl Siemens, M. Inst., C.E.

The rarity of old Flemish wall-painting gives a special interest to the discovery recently made (according to the *Academy*) in the Johanniskirche of Herzogenbusch, of a wall-painting dating from 1447. It has been brought to light from beneath the whitewash, and except that the colour is somewhat faded, is tolerably well preserved. It depicts Christ on the cross, with the Virgin and St. John; at the foot of the cross is a burgher family of the town, the donors of the picture.

A half-worked monolith has recently been discovered in the grounds of the Russian pilgrims' monastery outside the walls of Jerusalem. It is believed to be a column intended for the decoration of the ancient Temple of Solomon; but as the column split while it was being worked, it was left unfinished, the lower part of it remaining in a rough unhewn state. It is about 39ft. in length by 6ft. in diameter.

Mr. Edward Freeman, for the last three years clerk to the Royal Institute of British Architects, has been appointed resident clerk to the Architectural Union Company.

On All Saints' Day the Bishop Suffragan of Nottingham reopened the Church of Thrumpton, restored from designs by Mr. Street.

The Lambeth Vestry have resolved to take proceedings against the Loudon, Chatham, and Dover Railway Company for the alleged nuisance of the drip arising from the state of the railway bridges in that parish.

A new Congregational Chapel, built by Mr. Howland from the designs of Mr. Poulton, of Reading, was opened at Thame on the 31st ult.

Mr. A. W. Maberley, architect, of Gloucester, has been appointed surveyor, under the Ecclesiastical Dilapidations Act, for the district comprised in the Registry of Gloucester, and Mr. T. S. Pope for the Registry of Bristol.

A new Iron Presbyterian Church was opened at Edinburgh on Sunday. It holds 300 persons.

The "palatial barracks" at Allahabad, which cost more than £200,000, have been definitely pronounced so unsafe that the 104th Regiment were ordered to vacate them at once. The men are now under canvas.

A new low level reservoir, which has cost £1,100, was opened at Obau, N. B., on Friday.

Mr. Robert J. Johnson has been elected Surveyor for the Diocese of Durham under the Ecclesiastical Dilapidations Act, 1871.

THE BUILDING NEWS.

LONDON, FRIDAY, NOV. 17, 1871.

THE ART OF SPOILING PUBLIC BUILDINGS.

TO those who have been behind the scenes there is something amusing in the reasons popularly assigned for our great architectural failures. One writer will tell us that the English nation has no artistic powers. We once, it is true, produced such trifles as the choir of Lincoln, the octagon of Ely, and the spire of Salisbury; we covered the land with abbeys and parish churches which are not quite unworthy of notice, and we produced a quantity of domestic architecture which, if it is not showy, at any rate cannot be called coarse or vulgar. No matter; we *are* inartistic, and we ought to be proud of it. So our journalists frequently assert, not of course in so many words, but in that form of modest confession which cloaks the most outrageous type of vanity, the vanity which feeds even on weakness and incapacity. "Nature has not endowed us," we are told, "with the artistic talent of the French, the plodding industry of the Germans," &c., &c.; and there is an underhand implication throughout that all such qualities as these are very poor things, only fit to be despised as unworthy of our transcendent greatness. Another writer, with a little more discernment than the last, looks at our architectural failures with regret. He sees that we did not always fail, and he is sorely puzzled to find why we should do so now; and at last, not being able to discover any sufficient reasons, he ends by setting it all down to chance. We have had a run of bad luck, he fancies, in our public works; some day the tide may turn, and we shall do better. It is a matter of accident; we have been unfortunate, and there is no more to be said about it. Now for our own part we entirely dissent from both these theories. Our public buildings, as we believe, are spoilt neither by accident nor by incapacity, at least on the part of the nation at large. The spoiling of them is an ingenious and complicated process, which may properly be called an art, and of all the arts it is perhaps that which in modern England flourishes the most.

The best way of explaining the system will be by example. Suppose, then, that it is a new town-hall or vestry-hall, or church or chapel, that is wanted, and trace the common methods of proceeding. These methods, indeed, are not quite universal, and so our public architecture is not universally bad. In church building, particularly, the influence of art education amongst the clergy helps to modify them; and whatever our churches may be as regards convenience, in point of art they are often above the average. But we will take an average case, where the management is in the hands of an ordinary committee. If none of the members of this committee know anything about the design of buildings, the prospect is bad enough; but should there happen to be a "practical man" amongst them the case is ten times worse. For the truly practical man we have the highest respect. If he were only a practical mason or carpenter we would go to him for masonry or carpentry facts within his own knowledge before all the theorists in the world. But the most thoroughly practical man is only an authority in questions to which his practice has extended; and the practice of masonry or carpentry is but a small portion of architectural practice as a whole. The sort of "practical man," however, who generally gets on a committee does not deserve even this amount of respect. Nine times out of ten he is an impostor, empty, plausible, and loud. He has, perhaps, got a few technical terms by heart, or he may have spent a year or two of his youth in a

builder's office, or possibly he once drew a house plan which, with sundry indispensable modifications, was ultimately carried into execution. For these or some similar reasons he is held in great veneration by his colleagues; his opinion, which he is never backward in giving, is invested with mysterious weight, and, tacitly promoted to the leadership, he becomes the one-eyed king of the blind. The committee, we will suppose, have obtained a site; their next step is to procure designs. Each member has an architect whom he wishes to recommend, and as it is impossible to come to a unanimous choice it is decided to invite a public competition. The practical man draws up the conditions, which are chiefly remarkable for demanding more accommodation than can be expected for the money. Plans, of course, are to be sent in under mottoes, and the authors' names are supposed to be totally unknown. It is very remarkable, under these circumstances, that each architect's design should exercise a special attraction on his own private friends; that Mr. A., the chairman, for instance, should think no drawings comparable to those which ultimately prove to have been the work of his own son-in-law, and that Messrs. B., C., D., &c., should each and all show inexplicable affinities of a corresponding kind. There must surely be some occult influence conveyed into the paper from the fingers of the draughtsman, which can only operate on those who are in sympathy with him—a kind of "psychic force," in fact, like that now being investigated by Mr. Crookes. But though everybody on the committee may have his own preferences, everybody, it is plain, cannot have his own way. They must agree on some one design which can command a majority; and so they proceed to discuss what have been sent in. Design No. 1 is very plain; its architect adhered to the conditions and kept within the sum allowed—so he is dismissed at once. No. 2 is admitted to be "pretty;" but the practical man asks what need there is for all this waste of money at the sides and back; they only want a "front," and in search of a front they go on to No. 3. This is allowed by all, save a few fastidious members, to be the gem of the collection. It has a magnificent portico, with six Corinthian columns, an entablature with carved acanthus-leaf modillions, and a pediment with a small bull's-eye window in its centre. But this is not all. Contrast, as every one knows, is the soul of art; and what a contrast is here! Behind the Corinthian columns comes a fourteen-inch brick wall; behind the entablature, a cast-iron eaves gutter; and behind the pediment a hipped slate roof. Such a design could not fail of being adopted by acclamation; but alas! on turning to the plan, it is found too small. Carried away by the inspiration of genius, its author neglected the practical in pursuit of the ideal; he has enraptured the tastes of the committee and they give him a premium; but he has overlooked their requirements, and they cannot carry out his conception. With lamentation and regret they go forward, but the other drawings have almost lost their charm. They come at length on a plan which even they cannot help seeing is a good one; but then the elevation is not "pretty" at all. It is Gothic, and they might bring themselves to endure Gothic if there was plenty of tracery, and gables, and pinnacles, and crockets; Henry the VII.'s chapel, they think, is very pretty, so is Bethesda Chapel, in the High-street; but such Gothic as this they never saw in any chapel of their acquaintance. They accordingly vote it "heavy," and pass on—for heaviness, with committees, is the most unpardonable of sins. At length, puzzled and confused, they have gone through the whole collection. They would like the plan of No. 12, the front of No. 3, and the interior, say, of No. 20. But to each of these designs as a whole there are strong objections; and they end, perhaps, by fixing on a set of drawings which nobody likes, simply because

nobody has been able to point out any insuperable objection to them. Their author is accordingly appointed architect, and their committee pride themselves on having acted fairly and having resisted temptation. The next thing they do is to try and import the charms which have attracted them in other drawings into those which they have selected. The architect sees difficulties, and foresees a jumble. He argues, protests, and predicts disappointment. The practical man makes light of his objections, insists that the four designs can easily be amalgamated, and prepares, it may be, some marvellous sketches to show the way. If the architect is weak, the committee overpower him; he submits, perpetrates a jumble, and regrets it for ever after. The practical man, having gained his point, rises higher than ever in general estimation, and is appointed supervisor and director of the works. As the working drawings proceed, he looks them through, thins the walls, ruins the details, and takes care that the sides and back of the building shall be sufficiently shabby. All this he does, not so much for the sake of saving money as for the sake of asserting a principle: the grand principle of heaping all the ornament on the front wall. He does not even grudge expense when a reasonable amount of ugliness is to be gained by it, and though he would strike out mouldings as a wasteful extravagance, he revels in lead flats, gutters, and parapets. The next thing is the receiving tenders for the works, which are all, of course, too high. The committee asked for too much in the first place; they rejected, in the second place, the few designs that were within their estimate; and so it is inevitable, as a result, that the cost should outrun their funds. Then comes the cutting down. The design, already half-starved, is now reduced to the extreme of emaciation. Every item on which a saving is possible is reduced; if there was a tower, the tower is omitted; if there was a portico, the portico is flattened into a row of pilasters, the walls become a little thinner yet, the roofs a little weaker, the whole construction a little more trumpery and poverty-stricken. The works go on; the practical man still broods, like a nightmare, over all; and the building turns out at last about as well as if he himself had designed it. Such is the history of many and many a structure, at whose incomprehensible wretchedness all observers (save English ones) stand amazed. Well they may be, for the production of such work would seem impossible if we had not long learned how to do it. It is no easy matter to turn out such public buildings as ours. It could not be done by tossing up for the design to be accepted; it could not be done by blindfolding a committee-man, and adopting the first plans he laid hold of; it can only be effected by strenuous and unceasing effort towards the attainment of the lowest possible pitch of degradation.

Our example has been taken from the minor class of public works—from those which are rather local than national; but we manage the latter on just the same grand principles as the former. In great things as well as small, we follow one unalterable rule—that of setting everybody to direct what he least understands, and to do what he most earnestly protests against. If we have, by strange accident, a Minister of Public Works who is equal to his duties, we do not lose a moment in getting rid of him. London would not be London long, with such a man to direct her; make him an ambassador—nay, make him an admiral—rather than let him stay here. Have we an eminent Gothic architect appointed to design a most important building? The risk is imminent of his doing something creditable; our measures must be proportionately violent to hinder him. Compel him to work in a style he hates; even he may then keep our national reputation down to its traditional level. Such a feat as this, indeed, it is not given to every man to do. A Prime Minister accomplished

it once; but it is somewhat beyond the strength of the poor R.A. who has tried it lately. We venture to hope that the Law Courts may turn out somewhat differently from the Foreign Office, and that we may at last see an architect who, with all the plausible stupidity in England opposing him, will set our precedents at naught, and refuse to have any hand in spoiling the work on which he is engaged.

NOTES ON BRICKWORK.—III.

AS geologists trace the origin of the clay from which bricks are made to a mechanical abrasion of primitive rocks, the removal of the detritus by running water, and its deposit elsewhere as a new chemical compound in beds of clay, so they trace the lime which is used to cement bricks together to an organic origin chiefly, but find it mechanically and chemically mixed with other substances in greater or smaller proportions in the various lime rocks.

As pure clay does not make the best bricks, so pure lime does not make the best mortar or cement. Carbonate of lime (that is lime combined with carbonic acid gas in the proportion of about five parts by weight of the former to four of the latter—more exactly, 28.5 to 22) is the product of the organic remains of marine animals, thrown down at their death to the bottom of the sea in such immense quantities—for numbers are out of the question—as to have formed all the chalk hills and limestone mountains that we now quarry for use; these having been raised from their original position at the bottom of the sea to great heights above it.

Sea water contains a great deal of solid matter in solution, consisting chiefly of common salt, but still of a large quantity of carbonate of lime, and the marine animals secrete this during life, and deposit it in a solid form at death. Granting that this is a long way from brickwork, it is yet within the compass of the question. Carbonate of lime is the basis of the limestones burnt for use in mortar and cement, but it is mixed in variable proportions with other substances, oxide of iron, manganese, silex, silicate of alumina, or clay, and others. When clay is combined with carbonate of lime in the proportion of 10 or 12 per cent. the lime is said to be hydraulic, and the mortar made from that kind of limestone will set in moist places or under water in course of time. When the limestone contains from 20 to 25 per cent. of clay the mortar sets more quickly. When there is more than about 30 per cent. of clay present the product of calcination no longer retains cementing properties.

Smeaton, the celebrated engineer, was the first to find that it is to the presence of clay in the limestone that the property of setting under water is attributable.

The upper stratum of chalk (the white chalk), which contains flints, and is softer than the lower or gray chalk, is nearly pure carbonate of lime. When this is burnt, and the carbonic acid gas driven off, a quick lime is produced which will not set under water. The lower chalk, or gray chalk, has more the character of stone (hence called gray stone lime), contains few flints, and has slightly hydraulic properties; that is to say, it will set under water in course of time, but the long time it requires makes it unadvisable to use it for hydraulic works.

The mortar made from some of the beds of the blue lias limestone sets better under water than any other. The lias formation, of which these beds form a part, extends, with a width of a few miles only, from Lyme Regis on the Dorsetshire coast, by Shepton Mallet, Keynsham, and Bath, in Somersetshire; Cheltenham, in Gloucestershire; Shipston and Rugby, in Warwickshire; Barrow-on-Soar, in Leicestershire; Grantham and Gains-

borough, in Lincolnshire; and on through the East Riding to Whitby, on the Yorkshire coast. The best beds for hydraulic lime are not, however, found at all parts of this belt. For the Midland Counties the Barrow lime has long had a great reputation. Abertaw, on the Glamorganshire side of the Bristol Channel, has supplied vast quantities, and the lime from the Halkin Mountain, in Flintshire, is also of the blue lias beds. This latter lime has been used at the Liverpool docks for many years, and it has been found that rubble stone set in this mortar makes better work than squared stone set in ordinary mortar.

When the quick lime produced by burning carbonate of lime in a kiln at a great heat, so as to drive off the carbonic acid gas, is slaked, the substance forms a hydrate of lime, and when it is made into mortar by adding sand and more water, and is exposed to the air, it absorbs carbonic acid gas from it, and is again converted into carbonate of lime and becomes again hard.

Baron Liebig, the celebrated chemist, says that 551 cubic feet of slaked lime, in a moist state, weighs from 18 to 20 lb. and contains two-thirds of its weight of dry lime, and it absorbs, in order to be converted into carbonate of lime, 38.8 cubic feet of carbonic acid gas, aqueous vapour being at the same time given off into the atmosphere.

Damp walls of new houses on being first inhabited, absorb the carbonic acid gas given off by the inhabitants, and become dry sooner than they would if left uninhabited; but at the same time the aqueous vapour given off renders such houses very unhealthy.

And this is the cause of all mortar made from common lime and exposed to the atmosphere hardening after its use in setting brickwork—it absorbs carbonic acid gas, and is reconverted into carbonate of lime. The lime used in making up mortar should therefore be fresh-burnt, for if it is exposed for any considerable time before it is slaked, it becomes partly slaked by absorbing moisture from the atmosphere (for which it has great affinity), and at the same time absorbs carbonic acid gas from the same source, and becomes partially converted into carbonate of lime before it is made up, and will not afterwards set hard.

The lime derived from the upper chalk requires the addition of silica, or sand, to make it fit for mortar, otherwise it would not set. It is called a common, or fat lime, and its apparent characteristics are that in burning it loses, according to General Pasley's work on cements, about 4.9ths of its original weight. A cubic foot of solid chalk, quite dry, weighs 95 lb., but, on being broken in pieces of the size of a man's fist, a cubic foot of them, by fair level measure, will only weigh 63 lbs. When this cubic foot of burned chalk is slaked with water, it will be equal to—according to the same authority—one and one-sixth cubic feet, and by the solidification of the water during this process its weight will have been increased from 35 to 50 lbs. A cubic foot of chalk lime, fresh from the kiln, weighing 35 lbs., when mixed with $3\frac{1}{2}$ cubic feet of clear sharp river sand and one and one-fifth cubic feet of water ($7\frac{1}{2}$ gallons nearly), produces about $3\frac{1}{2}$ cubic feet of as good mortar as this kind of lime will make.

The increase of bulk given above—viz., that a cubic foot of quick lime in lumps makes one and one-sixth cubic feet of slaked lime in powder, is in the ratio of 1: $1\frac{1}{6}$ of a solid or homogeneous mass. If one lump of, say, 3 in. cube, containing 27 cubic inches, be taken, it would be increased in bulk by slaking to 47 cubic inches. All fat limes swell in about these proportions, or greater, and they carry a large quantity of sand. The lime made from the mountain limestone is of the same character. The gray stone lime of the lower chalk, such as that got at Merstham and

Dorking, in Surrey, and at Halling, in Kent, will carry nearly 3 of sand to 1 of lime; but the blue lias lime will not carry more than 2 of sand to 1 of lime, and the best mortar from some sorts of blue lias is made in the proportion of 1 of sand to 1 of lime. These latter limes swell but little in slaking. (When a given proportion of sand is directed to be used with one measure of lime, it is usually intended that that measure shall be made before slaking.)

Mortar made from limestones, which consist nearly wholly of carbonate of lime, as chalk—the fat limes—harden by absorbing carbonic acid gas from the atmosphere; but inasmuch as the quantity of this gas in the atmosphere is limited, the operation of it upon the mortar is slow, and all such mortar takes a long time to become hard, especially in the interior of walls, where it scarcely ever will harden. But the setting properties of hydraulic limes, such as the blue lias, depend, not upon absorption of carbonic acid gas, but upon a chemical combination of the lime with silica and clay, forming a double silicate of lime and alumina, and so, not being dependent on the air for that which causes this kind of mortar to set, it will set as well under water as above ground, and is, for that reason, called hydraulic lime. This kind of lime is difficult to slake thoroughly, in lumps, and it is ground to powder in revolving pans under heavy rollers, and is thus used in the same way as cement.

Whatever kind of lime the mortar may be composed of, the sand must have three qualities: clean, that is free from earth or clay; sharp, that is angular; and coarse. River sand has these qualities naturally, but pit sand requires washing before they can be produced.

After mixing the slaked lime with the sand they must be passed through a screen, to keep back the core, or unslaked portions, and to mix them more intimately. There have been questions raised as to whether stiff or thin mortar is better for brickwork, but the question will not bear a moment's examination. For all walls stiff mortar and wetted bricks are the only proper way of building sound work. The interior of a mass of brickwork, as the abutment of a bridge, or a retaining wall, &c., may be grouted with thin mortar, to save labour, without weakening the structure, but to treat walling in the same manner is ruinous. But neither will stiff mortar make sound work, unless the bricks be wetted if they are at all porous—and all bricks are so, more or less—and, moreover, to throw merely a few bucketfuls of water over a heap of bricks is not sufficient: they must be thoroughly wetted.

As soon as mortar is made up, it begins to crystallise, and therefore should be used as soon as possible after it is made, and after it is spread the process continues uniformly, when it is of the proper consistency, and is not robbed of its due quantity of water too soon. When there is too much water the particles of lime and sand are irregularly disposed, being congregated in different places by the motion of the water, small masses of lime appearing in some places, while corresponding small masses of sand are left in others, and this movement and irregularity of disposition prevents the continuance of the process of setting. When architects or engineers direct that the work shall be well grouted at each given number of courses in height, it is probably with the idea that the workmen cannot be depended upon to take sufficient interest in their work to perform it in a sound and workmanlike manner; but there must be something very rotten in a system of working where there is any distrust between master and workmen (we say nothing here of capitalists; the capitalist is the master of both), for both are equally interested in the success of the work, whatever it may be.

RANSOME'S PATENT STONE, &c.

IT is now a considerable time since we referred to Mr. Frederick Ransome's inventions, and to the toilsome progress by which he had reached a stage in the manufacture of siliceous stone, a point at which we thought he might be well content to "rest and be thankful." We have found, however, from a visit to the works of the company at East Greenwich, that we were mistaken, and that Mr. Ransome, in the continued exercise of his characteristic perseverance, has personally, and in conjunction with other inventors, Mr. Henry Bessemer, Mr. J. W. Butler, and Mr. Pye Smith chiefly, been pressing on to fresh triumphs.

It is not necessary to do more than briefly recall the important illustrations of the capabilities of Ransome's stone for decorative purposes, as exemplified in the great capitals of the University, in the Grecian style, recently erected at Calcutta; in the ornate fountain playing in the public gardens at Hong Kong; in the screens, designed by Sir Digby Wyatt, of the Indian Court, Whitehall; in the balusters, vases, and other ornamental "repeats" of S. Thomas's Hospital; and in numerous other situations. The more recent applications of the principles of Mr. Ransome's invention are to useful rather than to decorative purposes, but in this direction and for the material applied to structural purposes, new and important inventions have also been made, and patents for them secured.

Strange though it may seem, it is none the less true that from the production of a material that only an expert can tell is not real Portland stone, inventive skill has passed on to produce admirable imitations of red and gray granite, and porphyritic rocks of all kinds, including their large crystals of felspar; black, gray, Sienna, and other kinds of marble, veined and mottled in the structure, with a truthfulness to Nature that it would baffle the skill of the most accomplished "grainer" to surpass. These interesting specimens are shown with truly-worked mouldings, and a glassy polished surface, equal to productions in the natural rocks.

A further improvement in manufacture, or rather an additional application of the patent stone, relates to the production of stone caissons for sea and river walls, piers, &c., and other hydraulic works. In this application of the material Mr. Ransome is associated with Mr. J. W. Butler, hydraulic engineer. One of these caissons has recently been sunk, with complete success, at the entrance to the London Docks. It is 35 feet deep, and passes from the bed of the river down into the London clay. The cylinder is in sections of about 4 feet deep; they are 9 feet in diameter and 8 inches thick, and have tongued joints. The whole caisson was sunk with ease in the course of two days.

The works connected with structures that are founded under water are of two distinct classes, the preliminary and the permanent, both of which are very costly. The preliminary works include sheet piles, coffer dams, iron caissons, and the like, which may be superseded by these stone caissons, that are of a material of great strength, and adapted to serve as permanent piers and abutments. When sunk, they have only to be kept clear of water by pumping, and filled up with concrete, brickwork, or other material. The materials and process of manufacture of these caissons are totally different from those of Mr. Ransome's former method. The ingredients include, in the proportions found best, ordinary large sharp-grained sand, or even fine gravel, hydraulic cement, ground carbonate of lime, soluble silica, with an adequate quantity of Mr. Ransome's silicate of soda. In this combination the silicate of soda is decomposed, the silicic acid combining with the silicate of alumina and the caustic lime of the Portland cement. The caustic soda thus set free has an affinity for, and combines with, the soluble silica of the mass, producing

again more silicate of soda, which is again attracted and converted, until the whole is utilised, and completely fixed. The stone is hard, strong, and dense, and admirably adapted to resist the influences of heat, cold, water, or moisture. As regards its strength, it may be enough to say that it is proved to resist crushing force up to four tons, or 8,960lbs., on the square inch. Granite resists to from 8,000 to 12,000lbs., Bramley Fall to 5,120lbs., Portland stone to 2,630lbs., and wrought iron to from 36,000 to 40,000lbs.

The grindstones manufactured at East Greenwich, in vast numbers and of all sizes, are not now a novelty; but our readers will probably be "surprised to hear" that large numbers of these stones are constantly sent to the great engineering works at and near Newcastle, where they cost more money than the native article, which is there at home. It is an old saw that "Scotsmen and Newcastle grindstones are found all over the world." The proverb may continue true of Scotsmen, who are to be met with in every clime, and particularly on the green spots on the earth's surface, but it is ceasing to be true of Newcastle grindstones. The new patent article is now sent in great numbers to the colonies and foreign countries, and it is not to be wondered at that it is preferred to the natural stone; it is perfectly homogeneous, cuts more keenly, wears quite evenly, and has no yolks.

Another utilitarian purpose to which Ransome's invention is now applied is to the production of millstones for grinding wheat, rice, and other grains. The ingredients in these differ but slightly from those that are mixed for the production of grindstones. Care is exercised in the selection of hard sharp sand, with good cutting power, and in fabric the mass is harder than in the case of the grindstones. The millstone is moulded with grooves as deep as it will be safe to wear the stone. These are filled up to flush with the upper part of the stone with Portland cement, plaster of Paris, or other material softer than the stone. In use, these grooves wear to a sufficient depth to permit the flour to escape in the ordinary manner. If these stones can even do as much work, and as well, as the French burrs or granite mill-stones hitherto in use, it is palpable that they must possess immense advantages. They have now been in constant use in Brussels and other places for many months, and the ascertained advantages realised from their use are: lower first cost, they are driven with less power, do more work, and require no dressing or disturbance until they are worn down to the bottom of the channels. There is another advantage secured by the use of these stones, but it is only a question of life and death. The men who dress and fit the blocks of which the French burr stones are built, never live to be older than thirty-two or thirty-three years, and the dressers of burrs at work sustain proportionate inquiry from that part of their occupation. They are all choked and poisoned with the dust of flint and steel. From inevitable death, as a result of their occupation, there is no escape. The economical aspect of the question may be the most important in the estimation of some jolly millers, but it may be hoped, surely, that all will be ready to take in the humanitarian view, if only as a makeweight.

Another of the novelties to be seen at East Greenwich Stone Works is the manufacture of discs for saw sharpening and other uses. These are of various sizes and thicknesses, from one-eighth of an inch thick upwards. The chief ingredients in their composition are emery and silicate of alumina. The pugged material is packed into a strongly-made iron mould, into which a die is fitted, and the material is pressed by a hydraulic ram, exercising a pressure of 70 tons. The discs are dried and hardened either with or without artificial heat. The performance of these emery discs is surprising. Their keen cutting power is to be seen at the works,

East Greenwich, and also at the works of Messrs. Allen Ransome & Co., King's-road, Chelsea. Some of these discs have been in constant use daily at a large saw mill, and at the end of three months are not nearly worn out. One of these discs, $\frac{1}{2}$ in. thick, will attack a saw blade an eighth of an inch thick and cut it at the rate of six inches per minute! This valuable substance—emery—is found in large quantities in various parts of the world, as at Naxos, in the Archipelago, Spain, Poland, Jersey, Turkey, Austria, Smyrna, Minnesota (United States), &c. It is of the nature of corundum or adamantite spar, but really consists of the flinty shells of deposited masses of animalcules. It seems likely that these emery discs will come into extensive use for many purposes to which they are capable of being applied, in addition to saw sharpening, and not unlikely that they may exercise an important influence upon file-cutting and file-using.

The works of the Ransome Stone Company and East Greenwich are well worthy a visit by any one interested in construction and cognate arts.

DILAPIDATIONS.—III.

LAW.

TABLE 7.—RIGHTS AND LIABILITIES OF TENANTS FOR LIFE.

1. LIABLE to repair (even though he be such without impeachment for waste).
 2. Cannot make remainder man contribute (not even where new roof required through dry rot).
 3. May have allowed him, the expense of finishing a mansion house left unfinished by testator.
 4. Must not pull down houses.
 5. If he has pulled down houses, equity will compel him to rebuild.
 6. Must not cut down timber. (Note.—Court of Equity will restrain.)
- Nos. 4, 5, and 6 cannot be done even where the tenant for life is without impeachment for waste, although such words give the tenant a greater interest and more extended powers than an ordinary tenant for life.

TABLE 8.—LIABILITY OF TENANT FOR YEARS WITHOUT IMPEACHMENT OF WASTE.

1. Tenant may not cut down trees *towards the end of term*, it seems, where he had not cut them down before during the term.

TABLE 9.—LIABILITY OF MORTGAGOR.

1. Bound to recoup any proper outlay made by "mortgagee in possession" in repairs.
2. Must not cut down timber.

TABLE 10.—RIGHTS AND LIABILITIES OF MORTGAGEE IN POSSESSION.

1. Bound when in possession of the estate, to preserve the premises from occasional, or accidental dilapidations.
2. Bound, like any other tenant, to keep the buildings and other parts of the estate in ordinary repair.
3. Not liable for gradual decay, the effects of time.
4. May pull down ruinous buildings and erect better ones, to prevent a forfeiture; but he cannot alter the mortgaged premises.
5. May cut down and sell timber, where land is of insufficient security—not otherwise.

TABLE 11.—RIGHTS AND LIABILITIES OF YEARLY TENANTS.

1. Not liable for permissive waste.
2. Only answerable when injury happens to premises through voluntary negligence.
3. Not liable for dilapidations.
4. Not liable for inevitable accident.
5. Not liable for accidental fire.
6. Bound not to commit any waste.
7. Must perform fair and reasonable repairs, such as putting in windows and doors that have been broken by them, so as to prevent waste and decay of the premises.

8. Must keep premises wind and watertight.

NOTE.—This seems to be the extreme requirement according to the cases, but I would remark, that it appears to be opposed to the custom of London, where the tenant always considers the landlord bound to do all repairs; and within my experience in the North of England and London, I have never known a landlord succeed, where he has required a tenant to repair the roof.

9. Not liable for wear and tear, and the like.

10. If farming premises, only bound to do fair and tenantable repairs, preventing only waste or decay of the premises, but not liable for substantial repairs.

11. Liable only to use farm in a husbandlike and tenantlike manner; that is to say, according to the custom of the county in which the land is situate.

TABLE 12.—RIGHTS AND LIABILITIES OF TENANTS IN COMMON, AND JOINT TENANTS.

1. Each tenant is liable for voluntary waste.

2. None liable for permissive waste.

3. Each tenant is bound to contribute towards the reparation of decay caused by time or other circumstances.

4. Are liable to keep in tenantable repair where only life interest, or for a term of years.

5. Not liable for waste.

It appears no action at common law is maintainable between tenants in common and joint tenants for waste.

NOTE.—It is worth remembering that a tenant in common, or a joint tenant, cannot enforce a partition of an estate.

TABLE 13.—RIGHTS OF COPARCENERS.

1. No liability at all as to repairs or dilapidations.

The reason because any of them might at common law have enforced a partition.

It will be seen from the foregoing Tables that those numbered 3, 4, 5, 6, 7, 8, 12, and 13, relate to those classes of tenancies which do not usually come under the surveyor's notice, while the Tables 9, 10, and 11 relate to those that are of almost daily occurrence.

COVENANTS.—THEIR CONSTRUCTION AND ACCEPTED MEANING.

Having given in a tabular form the exact liabilities of the different parties, we next have to consider the meaning of the covenants and their construction by the authorities; and when we shall thus have cleared away the outworks, we will proceed to dilapidations (lay) and waste. To be well grounded in the subject, the following table must be studied and remembered:—

1. A covenant to repair *forthwith* does not mean by any specific time, but it is held such covenant must receive a reasonable construction.

2. Where the covenant in the lease of a dwelling house with the appurtenances, for a term of years, contains the covenant to keep and leave the house in repair, this is satisfied by keeping it in *substantial* repair, according to the nature of the building; and with a view to determine the relative sufficiency of the repair, the jury may be directed to inquire whether the house was new or old at the time of the demise.

3. Held, that "habitable repair" and "tenantable repair" were about of equal value.

4. The covenant to repair does *not* permit the pulling down and rebuilding. If, however, premises *fall* down, they must be rebuilt under this covenant.

5. *Important* to remember when covenant is to keep the premises in *good and tenantable* repair, and to surrender them at the end of the term in like tenantable condition, reasonable wear and tear excepted. The meaning of this covenant is good tenantable repair, having regard to the state of the premises in point of age. The landlord is not to have, at the end of term, a new house at the tenant's expense.

The general state and condition of the premises may be shown, but not matters of detail.

6. "The same nicety of repair is not enacted for an old building as for a new one."

7. Liability to repair attaches sometimes where no lease is in existence.

The following case I quote in confirmation:—An agreement for a lease of copyhold premises for a term of years to be granted as soon as a license could be obtained from the lord of the manor, and to contain a covenant for proposed lessee to keep premises in repair during term. Proposed lessee entered and occupied the premises for the term. Held, he was liable on the covenant to repair, though no lease had been made to him pursuant to the agreement, nor any license obtained from the lord for that purpose.

8. *Good repair* would appear to be equivalent to *habitable repair*.

The case is *Cooke v. Cholmondeley*, where it was held that the premises were not to be kept in as good repair as at the time of testator's death, and that *good repair* would not have reference to that term, but that the premises must be kept in *habitable repair*.

9. *Farming buildings*. These words are held to include the farmhouse in the covenant to repair.

10. Where the covenant to repair provides for "leaving or taking in and upon the demised premises competent housebote," &c., "without committing any waste or spoil." The covenant to repair is *absolute*, and does not depend upon the lessee being able to find such competent and sufficient housebote.

11. Where covenant in a farm lease "well and substantially to repair, and keep in good substantial repair, and so well and substantially repaired to yield up, &c." This covenant is construed to mean in as good a state of repair as when lease was granted; and thus they must be *inferred* to have been in a tenantable state.

12. *Fire*.—The general covenant to repair, and leave in repair at the end of the term, necessitates rebuilding the premises in the case of their destruction by accidental fire.

It is well here to remark that though a lease contains a covenant to insure the premises for a specific sum, if the premises are burnt down, the liability on the covenant to repair is *not* limited to the amount of the sum for which the premises are insured. I would repeat that lessor or his assignee cannot be required to rebuild even though he may have voluntarily insured the premises and received the money.

13. It is a breach of the covenant to keep in repair, to break a *doorway* through the wall of a demised house into an adjoining house.

The continuing the doorway after so broken through is also a breach of this covenant.

14. It is not a breach, however, to enlarge windows, to open external doors, and to take down partitions.

15. It is a breach of the covenant to pull down and rebuild a house in a different fashion, even though the new one may be more valuable than the old.

It has been held that converting a brewhouse into tenements of greater value is *waste*, and also that converting two rooms into one is *waste*.

16. *Boundary Walls*.—These are included in the general covenant to repair *external parts* of the demised premises.

17. *Fence Walls*.—Where covenant "to repair, uphold, support, sustain, and maintain the brick walls to the demised premises belonging." HELD, that this covenant is broken, where a brick fence wall which divided the court-yard at the front of the house from another yard at the side of the house, is pulled down.

18. *Party Walls*.—The general covenant to repair does not affect these walls where the premises are leased at a rack rent; as the Metropolitan Buildings Acts relieve such lessees, and place the liability on the lessors.

19. *Three Months' Notice to Repair*.—It is sometimes considered that no action of ejectment can be brought without this notice, but surveyors should remember that in nearly all leases there are two distinct covenants—one, to repair on receiving a certain notice; the other, to repair generally; and the action on the latter may be brought at any time without notice, and it is no answer to such action to say that no notice has been given.

I should mention if, however, these two covenants form one sentence, which they would do when they directly follow each other, and that the sentence is not complete without including both covenants, that then notice must be given before bringing action, as it is HELD that it is only *one* covenant.

20. The covenant to repair during the term, &c., and the covenant to leave premises in repair at the end of the term, are separate and distinct covenants, therefore notice is *not* necessary to sustain an action for non-repair at the end of the term.

21. *After Lease Expired*.—It must be remembered that the liability continues under the covenants where tenancy continues, and no fresh agreement or lease is entered into.

It has been HELD that in such cases of holding over, where premises burnt down, bound to rebuild as if lease had not expired.

22. Covenant by a fixed day to repair, would not, it appears, be broken, if there were anything of importance (as a plague in a house) to prevent the repairs being completed; but they must be done within a reasonable time afterwards.

23. There is usually a covenant in leases, authorising lessor's sending his surveyor, &c., to inspect state of the premises, and take an account of wants of reparation; it has been held, even where no such covenant, that the lessor or reversioner may, at *common law*, enter upon the premises for this purpose, provided notice be given of such intention, and that if tenant obstruct him, he is liable to an action on the case.

I think the foregoing explanations will be sufficient to enable the reader to understand the value of the various covenants. I therefore propose to consider next DILAPIDATIONS and WASTE: what they are, and how they are practically to be dealt with. B. F.

THE OWNERSHIP OF DRAWINGS: A SUGGESTION.

THERE is a tradition that "once upon a time, when George the Third was King," one of his ministers—Lord North, if we mistake not—failed to satisfy his sagacious majesty as to the precise *pros* and *cons* of a knotty point of international policy or finance it was necessary to conclude with the Royal sign-manual. We do not remember the point in question: it was some Schleswig-Holstein question of those times, which poor Lord North, like a certain jaunty minister and "Roman citizen" of our own day, might once have "understood," but didn't at the moment understand, or hope to ever understand again." Any way, his Majesty would not sign the paper set before him, and, to Lord North's dismay, insisted on having every one of the State papers relating to it brought to the palace, and submitted to him for consideration. "They are most voluminous," quoth the minister. "Never mind," said the King; who, the chronicler tells us, had to change his note, on seeing a day or two after a waggon-load of documents driven up to his palace windows, with more waggons to follow.

Now, if any one shall say, "What has this tale to do with architects?" we reply, "Everything to do with them." It is forcibly revived in our mind by reading in last week's BUILDING NEWS the admirable address of the President of the Architectural Association, with his suggestion for meeting the almost forgotten professional difficulty about the ownership of architects' drawings. Looking back upon that famous question—settled for the time being, never perhaps to be usefully or innocently put to the test—we can well afford to be facetious about it. We can fancy our Fourth George insisting on Mr. Nash producing for his Majesty's inspection and consideration, or stowing away as he listed, every one of the drawings of his gimcrack palace, the Pavilion, at Brighton. The question perforce would follow. What could he do with them? Was there ever in this world a house-builder, from the Royal owner of the Brighton Pavilion down to the plebeian proprietor of "the house that Jack built," that really would, if he got sight of them all in a lump, care to have in his possession for ten minutes the working drawings of his architect, after completion of his

building? If in even the architect's office they constitute the veriest rubbish, hardly ever drawn for inspection out of their dusty receptacles, and only preserved because as his client or his builder may raise some question on them, he hardly feels warranted in burning them, and any way, while lying on his own dusty shelves, they can at least be put to no sinister use—if we say, these only be the architect's motives for preserving them, what earthly motive can any one else have for their preservation, or rather for their capricious and merely temporary possession? It is a matter of common occurrence for a client, or a contractor, years after the latter has lost or destroyed his own copies, to apply to an architect for, not only a sight but, an explanation of, some plan or detail indicating the forgotten anatomy of a building about to be altered or enlarged. Does any one suppose such a drawing would be forthcoming were the client to be the *cusios rotulorum*, and the builder or the architect were to apply to him in their turn for a reference to them? In such a case there is not the remotest probability of their being found; or, if discovered at all, is there a chance of their being decipherable? Their inevitable fate is mournful to contemplate. Suffice it to say it is only the practical architect who can appreciate the childishness of the demand for his used-up drawings.

Still we architects must abide by the law; and the lawyers, who have never understood the question, and, having no special interest in it, have never studied it exhaustively, have decided this claim to be valid. Henceforth, if a client asks for them, he must have the drawings from which his building has been erected. As a rule we quite believe that for any honest purpose they will not be asked for. Our view of the matter is that, if on the completion of any considerable "job"—say a private mansion—an architect were to make out his bill, and carry it with all the drawings, &c., to his client, the latter would be amazed at their bulk and their intricacy; and, if told at the time, it would never do to lose or destroy them, would conjure his architect to carry them all back again; and, as a favour, rid him of the worry and the dust that would arise from their retention.

Such, we think, would be the probable action of nine clients out of ten; and they would act wisely. But the dry legal point remains, and might any day be brought to bear upon some one architect in a most vexatious way. We think, therefore, the profession is indebted to the President of the Architectural Association for his revival of the question, with the well-timed inquiry how architects are in future to deal with it. He makes a suggestion of his own which, as we do not learn that it evoked any discussion among the members, we shall call special attention to; for it is well worthy of general adoption, with some slight modification we should recommend.

Mr. Plumbé's suggestion is as follows. He says:—

"I would propose, in cases where clerks of works are employed, to at once make the copies of the drawings deposited on the works the contract drawings, the originals being made attested copies, left in the care of the architect."

And he then proceeds to say what he would do in cases where there was no clerk of works. In each case, as we understand him, the drawings so deposited would belong to, and when done with be handed over to, the client or employer; and he concludes:—

"If that practice were carried out more generally, which exists in some offices, of demanding the builder's copy from him at the close of the work, and of handing it over to the client, this question would hardly have arisen."

We have certainly heard of one-half of this practice, but never before of the handing over to the client. Architects, even where they stipulate for the builder's return to themselves of their drawings, generally forget all about it; ordinarily, when they act on the

stipulation, they themselves retain the drawings handed over to them. If any architects hand these drawings over to their clients, as Mr. Plumbé asserts, we can only say that, as far as these architects are concerned, no question can possibly arise; and the difficulty, which he rightly describes as a formidable one, likely to involve architects in the cost of a third set of drawings, vanishes at once. It is on this suggestion of Mr. Plumbé's that we shall presently found what we trust may be accepted by our professional readers as a practical regulation for their general adoption. Judges, of course, can deal with bygone facts, and decide to whom existing chattels belong; but it rests with architects to define *à priori* what shall be done on any certain building with this or that material, this or that officer, this or that document, &c.

Now the facts are very plain and simple. Every architect issues two sets of contract drawings and specifications, one of which he very naturally expects to retain himself, for obviously just reasons. He cannot afford, on his mere commission, to supply a third set of contract drawings and specifications; nor is it fair to require it. He also issues a set of detail drawings. These some architects do, and some do not, copy for their own office use; but, anyhow, whatever working drawings are made are delivered to the contractor, whose final dealing with them varies very considerably. Some contractors return them (as we have seen) to the architect; some (by far the majority) lose them, wear them to tatters, or burn them; and some (and a small minority, let us say, to the credit of English contractors) stow them away in drawers, as "cribs" for future works, of which they may officiate as "architects and builders," so-called. There is every reason why, to adopt Mr. Plumbé's suggestion, these documents should be held to be the special property of the client, or employer; and we think the whole question of their ownership should be dealt with at the drawing up of the specification and the agreement, by the introduction into the general conditions of some such clause as the following:—

The original contract drawings and the specifications are to be lodged with, and are to remain the property of, the architect, for his future reference, whether official triplicate drawings are needed or not. Should such triplicates be needed (for deposit for public purposes or otherwise, which the contractor is before delivery of his tender to ascertain), he is to include the cost thereof in his tender. The employer, through the architect, will provide the contractor with free copies of all contract or detail drawings and specifications required during the carrying out of the works. These are to be by him carefully mounted and preserved, accessible at all times "on the site, and not elsewhere," during the progress of the works, and if lost, stolen, or destroyed, they are to be forthwith replaced at his (the contractor's) own expense; nor shall any allowance of time be made to him for any delay that may thereby accrue. At the final settlement of the accounts all these several documents, owned by the employer, are (save with his leave to the contrary) to be delivered up to him by the contractor, whom no certificate of the architect shall release from his liability to their safe custody and return to their owner.

It will be seen that, in place of Mr. Plumbé's suggestion that the drawings, &c., be lodged with the clerk of the works, we would deposit them with the contractor. This course is made necessary by the liabilities imposed upon him. The clerk of works, being the servant of the client or his architect, could not, of course, be made amenable to the contractor. Moreover, the contractor, being ordinarily a more substantial person, and one not, like the clerk of works, liable to removal from the site, is the safer recipient of the documents.

Were the suggested course adopted, we imagine ninety employers out of every hundred would waive their right to the troublesome care of the drawings, &c.; and (since few contractors would covet their possession) they would all find their way back in the long run to their proper destination, the architect's office. If not, we leave our professional friends to say whether any one would be

seriously incommoded, not to say damned, by their contrary disposal. Let us hope that no client, tired of preserving them, would dispose of them—horrible thought!—by the pound *avoids* as waste paper, and so subject his unlucky architect to the chance of seeing them for re-sale at sundry pence each in, say, a marine-store-dealer's shop.

S. S.

THEORY OF THE ARTS.

ARCHITECTURAL COMPOSITION.—IRON AND METAL WORK.—DECORATIVE USE.

(Continued from page 344.)

THE distinct properties of wrought and cast iron should invariably determine the office or use to which we assign the one or the other in construction. We often see a wrong application of iron, doubtless through the competition there is among manufacturers. We must know that wrought iron is tougher, more fibrous and malleable, than cast iron, besides being not so much liable to be damaged by impact or sudden shock. Its tensile resistance is 27 tons per square inch, though 7 tons is taken as a safe strain. It is therefore for such offices as ties, tension rods, &c., the strongest material we possess in building. Its compressive strength is considerably less in proportion. The maximum crushing force is computed at 25 tons per square inch, but its flexibility renders it useless for anything like such a resistance, and about a third of that force will often buckle girder plates. The power of resistance to compression of this iron is to its power to resist tension as 9 to 11, according to experiments made by Stephenson and others. In cast iron, on the contrary, the proportion is reversed, the resistance to compression being to that of tension as 5 to 1. Cast iron, too, from its more granular, brittle, and unmalleable qualities, and its liability to crack under sudden change of temperature, seems to place it as the proper material for compressive action, or the office of sustaining weight, as columns, stanchions, and the like. Its power to resist tension per square inch is 7.87 tons, while its crushing strength is 41 tons; so it really possesses just the opposite properties of wrought, and its resistance to force just the inverse.

These proportions should guide the designer in giving to his girders and columns the relative proportions of sectional area they require. Thus, in a cast iron beam the neutral axis is situated about 1-6th its depth from upper side, the resistance it has to compression being six times greater than that to tension, and on this account it follows the lower flange should have a larger area of section than upper. On the contrary, a wrought iron plate beam requires, according to Fairbairn, the area of bottom flange to be 4-5ths that of the top, so that when loaded the upper and lower parts or the two opposite strains should balance or act simultaneously. As to depth the best proportion is 1-13th the span; a less depth necessitates a larger sectional area, which increases cost. The most economical distribution of metal for a girder requires, as in the case of wooden beams before noticed, the greatest sectional area in the middle, decreasing gradually according to a regular law towards the ends or supports. A parabolic curve is the line such a proportion assumes, and the arched or bow-string girder consequently is the most perfect form, making a beam equally strong throughout. Trussed girders may one day be acknowledged to be the most economical system of carrying weight, but Mr. Fairbairn has shown where their weakness lies; namely, the impracticability of adjusting the tie rods and straining pieces in such an accurate manner as that when called into action they may act simultaneously, for, of course, if either was called into requisition before the other, it must necessarily receive all the strain, which should be equally shared.

Further, it has been ascertained from the different behaviour of cast and wrought iron under atmospheric changes, that the elongation and elasticity of the two metals are quite different, and that on the first load, or at a certain temperature, all adjustment would be destroyed. It is known that wrought-iron expands more than cast, and hence a combination of the two must meet this discrepancy to successfully act in concert in any system of trussing. Mr. Fairbairn (see "Application of Cast and Wrought Iron to Building Purposes") has elaborately investigated the merits of cast and wrought-iron as materials for beams, and has adduced some valuable experimental information on the subject. He shows that the unequal contraction of cast iron in cooling through inequalities in the mixture of the metal, causing some parts to suffer extreme tension, and frequently to produce fracture, renders reliance on this metal uncertain, as castings have frequently snapped without apparent cause. Its crystalline structure, extreme brittleness, and the imperfections of casting, such as air bubbles, scoria which cannot possibly be detected either in or after its manufacture, and the influence of time and temperature on cast iron, are important points to be remembered in using it for purposes where strength and elasticity are required. The same great authority has published some valuable results as to the extent the agencies of time and temperature have in affecting the strength or resistance of cast iron. He found that its elasticity was injured with one fifth of the breaking weight, and that there is a progressive increase of deflection by a continuous strain, caused by vibrations and atmospheric changes, oxidation, &c. Indeed, the great question he undertook to solve was to what extent cast iron could be loaded without endangering its security? and such a question is still problematical in respect to the influence of time on cast iron under a continuous strain. The failures of numerous cast iron constructions must convince practical men of the importance of this question. These remarks lead to the conclusion that cast iron should never be used where great transverse or tensile strains are produced, but that we should invariably have resort to wrought iron in one of its numerous forms. On the other hand, cast iron may advantageously be used for many of those purposes for which it is now employed, such as in columns, or for any use in which simple compression is produced, and for many of those other decorative offices about buildings where disturbance, shocks, and strains are not felt.

Before speaking of the more decorative uses of iron, I may simply refer to some constructive adaptations. One of the simplest and most clever is Nasmyth's patent girder for roofs and fireproof floors. This is constructed on the bow and string principle, and consists in an arched plate of iron placed within the turned-up ends of a bottom or tension plate, which by preventing the spread of the upper plate, forms a beam of rigidity. A solid fitch or web plate may constitute the tensile part, and the arched bow be united or riveted to this. Another simple contrivance, though a composite kind of girder, is that recently patented by Mr. Henderson, which consists of a fitch, or plate, at the ends of which skew backs or shoes are formed for a flat brick arch to be turned. This is a similar, but more practicable method of using the tensile resistance of wrought iron in a very economical manner. The combination of iron with wood, brick, or concrete for fireproof flooring shows us how usefully the strength and rigidity of iron may be employed where depth is valuable. There are various systems adopted, but those in which a kind of concrete forms the floor or ceiling, have the advantage of combining two thoroughly fireproof materials in such a homogeneous manner as to give the strength and compactness of a solid brick construction. Among these the "Dennet" arch and one or

two recent patents are well known, and need not be particularised here.

Considered decoratively, the distinction I have drawn between cast and wrought iron must be quite as marked. One kind requires very opposite treatment to the other. One of the principal offices in which we can consider the decorative use of cast iron is that of supporting, as columns, as we have seen that it lends itself better to compressive force than any other. The crushing force for cast iron is given at about 41 tons to the square inch. As to strength of iron pillars, we have to consider height, diameter, and area, as affecting the limits to be allowed in practice. Mr. Hodgkinson's experiments, or those of Euler, are approximately correct. The theory of Euler is that the strength of any prismatic column of any material increases as the square of the sectional area divided by the square of the height. Mr. Hodgkinson's deductions are:—

(1.) That the strength of solid uniform cylindrical columns of cast iron varies directly in the proportion of the 3-6th power of the diameter.

(2.) The strength of uniform hollow cylindrical columns varies directly as the difference of the 3-6th powers of the major and minor diameters.

(3.) The strength of uniform cylindrical columns, whether solid or hollow, varies inversely in proportion of the 1-7th power of the height. Euler's formula for solid columns is—

$$W = \frac{D^4}{h^2}.$$

The constant for solid and hollow columns may be taken as 44. The multiple of safe weight should never be less than four of breaking-weight. In actual experiment, we find a column above six diameters high subject to be bent, and therefore, in the majority of ordinary cases in practice, they break or give way by a combined action of crushing and flexure, and both these causes of failure have to be taken into the calculation in determining the strength. Under such conditions, or when not long enough to fail from simple bending, and too long to fail from crushing, columns are proportionately weaker than when their height is greater.

Of the sections or plans for cast iron columns, the hollow cylinder is the simplest; a slight swell near the centre adds beauty and a small increase of strength. A pleasing variety of forms may, however, be adopted, taking the round as a basis—namely, the form used in the Exhibition building of 1851, on which the plain circular plan is relieved by four broad filets or faces; the polygonal shape; a cross section, strengthened at intervals by angle-blockings of various forms, may also be very pleasingly treated, the vertical flanges (if they may be so termed) being continued at the top in the direction of the floor, or supported girders as curved brackets. The caps and bases admit of a variety of decorative treatment, and may be attached to the shaft as separate features. Papier-mâché is often used very effectively. In every case a column of iron should express its office, and not appear to be treated too capriciously.

G. H. G.

(To be continued.)

PEDESTALS.

By THOMAS MORRIS.

(Continued from page 345.)

THE Place received its name from the old palace or Hôtel de Vendôme, which was taken down to make way for the present square, erected from Mansard's design in 1699. The column was begun in 1806, and finished in 1810. It was intended to record the victories of the French army in Germany, and the remarkable reverse of fortune lately experienced ought to qualify the glory of conquest and abate the victor's pride. But "life is short and art is long," and but for the inconceivable atrocity of the Communists of 1871, this column of

Napoleon might have escaped such a vicissitude as it met with at their hands till Paris reached the present age of Rome. The indignity it suffered in 1814 at the hands of the Allied Powers of Europe was comparatively petty and personal. The importance of such a monument to the world of art was in some degree irrespective of its intrinsic excellence. The spiral band of *relievi* measured eight hundred and forty French feet in length, and the height of the figures (two thousand in number) three feet eight inches. The bronze employed weighed, in the whole, about three hundred and sixty thousand pounds, the produce of twelve hundred pieces of ordnance taken from the enemy. The bas-reliefs of the pedestal represent the costumes and weapons of the defeated armies.

Rome contains a second column of the same historic nature as that of Trajan, erected A.D. 174 by the senate and people to the best of emperors, Marcus Aurelius Antoninus, in commemoration of his victories over the Germans, Armenians, and Parthians. It has been the pleasure of critics to denounce this work as inferior in merit to its predecessor, and it therefore seems allowable to weigh the grounds for the adverse judgment. As to a precise adherence to the rules of the architectural order to which they are generally assignable, I think it unworthy of serious consideration. These columns were not employed edifically, but with a special and exceptional purpose. Their design, therefore, is not to be judged by the standard of the peristyle or the portico. We must seek that in the temples of Athens or in the

"Sanctuary and home
Of art and piety—Pantheon! pride of Rome!"

imitated for the Londoner's convenience at the churches of S. Martin's-in-the-Fields and S. George, Bloomsbury. The works under notice are historical records, each "to be read round and round a long convex surface," the eye fixing on the cue at the base and being carried in a sort of volute widening over the adjacent area till the final revolution has prepared the observer for presence with the honoured hero at the top. (It is, of course, needless to say that at the instance of Pope Sextus V., and after due exorcism, S. Peter has taken the place of Trajan, and S. Paul that of Aurelius.) The surface of a cone is as convex as that of a cylinder, but wholly inferior for the display of such a tablet of design as that by which either of these pillars is involved. In a picture-gallery, works much above the horizon are inclined so as to bring them to a right angle with the axis of vision, and what the Roman architects wanted was, in fact, no other than an inverted cone, but which the conditions of stability at once forbade. It was incumbent upon them, however, not to run needlessly into the opposite extreme, and the cylinder, with just so much of diminution as would cover practical defect or visual illusion, was the proper and artistic choice. A century had passed when the design of Apollodorus was to be repeated. Its merits were sufficiently admitted by the homage of imitation, but its failings were made subjects of improvement. The base of the first was only a cube with the plinth and cornice included, and the effect, judged by modern notions of proportion, is undoubtedly somewhat squat. This was failing the first—trifling enough, it must be admitted, and the second was yet more venial. The peculiar destination of the shaft being perceived, it would be only a natural solicitude with the second architect to make it approach as closely as other considerations would admit to an actual cylinder, and the diminution is accordingly made only about one-sixteenth of the lower diameter. In the third place, the relief compatible with a band of four feet or so in width must necessarily grow indistinct after a few revolutions, and the relief is increased in the later example. In what way soever these changes may present themselves to amateur critics, I cannot but feel that they are by no means to be assigned to a decadence of taste. They appear, on the other hand, allied to sound and rational principles, patent to the disciples of art in every age. On this column the figure of Jupiter Pluvius is represented dispensing copious floods of rain to revive the parched and fainting Romans. This is the Pagan acknowledgment of a benefit really due, it is said, to the prayers of the legion of Mytilene Christians. Another important group is composed of two large trophies of arms and armour with a figure of winged Victory in the middle, making a record with a stylus on an ellipse or shield. The Herculean method of construction, noticed in the earlier example, is followed here. Twenty-eight pieces of white marble sufficed. The shaft took nineteen. The block forming the abacus is seventeen feet four inches square, and five feet deep. The top of this block is one hundred and twenty-two feet eight inches from the ground, out of which dimension twenty-five feet eight inches belongs to the pedestal. Except this vertical measure, little or no trace of the original

pedestal remains. A facing of new marble was given by Fontana when he repaired the two columns in the sixteenth century, but it is far from equal to the Roman work or bolder compass of ancient thought. An inscription shows that the column was then confused with one dedicated by Aurelius to Antoninus Pius, but the latter was discovered on Monte Citorio in 1709, and the error set at rest. The monument thus found was soon afterwards destroyed, and the pedestal (ornamented with *relievi* of funeral games and the apotheosis of Antoninus and Faustina) carried to the gardens of the Vatican, where it remains. It was thus made evident that the monument which gives its name to the *Piazza Colonna*, in which it stands, is the testimonial erected A.D. 174, by the Senate and people to Aurelius himself. Like that of Trajan, it is grandly represented by Piranesi's engravings. The loss of all authority concerning its original pedestal is a disadvantage, but cannot support any inference that it was of less excellence than that of its fellow example, and the two works may be justly paired in the way Mrs. Eaton has adopted: "The sight of the stupendous columns of Trajan and Marcus Aurelius, which alone stand triumphant over time, while the proud trophies of a long list of tyrants are laid low in the dust, make us involuntarily admire the poetical justice displayed in the perfect preservation of those sublime monuments of the best and greatest emperors Rome ever produced; the sole, who deserved the victor's laurel and the civic crown; who united the praise of pre-eminent virtue to that of military glory, and who, on a throne too often sullied with every vice and every crime that can disgrace human nature, were at once the conquerors of distant nations, and the fathers of their people."

The form of the pedestal for the surmounting statue of the emperor was probably the same in each instance, and consisted of a cylinder with a hemispherical top, the fitting emblem of universal dominion. This pedestal is followed in the York column and at the Place Vendôme.

One ancient example at Rome must have had its history revealed shortly after Byron addressed it as

"Thou nameless column with a buried base."

The pedestal was restored to the light in 1813, and an inscription proved it to have been erected to the Emperor Phocas, A.D. 608, by excavations carried on by Elizabeth, Dowager Duchess of Devonshire, who was long a resident at Rome, and took deep interest in its antiquities; the steps on which the pedestal was placed were also discovered in 1816. The meanness of their construction is favourable to the belief that the column itself had been taken from some ancient edifice. The Corinthian shaft consisted of eight courses of Greek marble, and supported a gilt statue of the emperor.

The Rothall column of the Consul C. Duilius, commemorative of his victory over the Fleet of Carthage, B.C. 259, had the pedestal of a proportion that appears somewhat clumsy, since it was necessarily adapted, not to the shaft alone, but to the general figure inclusive of the paws.

As to the eastern capital of Byzantium, proper no vestiges remain, except by possibility some portions of Cyclopean wall dividing certain gardens from the streets. But of the "amphitheatre of peopled hills," as Constantinople has been called, there are many interesting monuments. The column erected by Constantine was of wonderful construction. The shaft consisted of ten blocks of porphyry, each upwards of 9ft. high, and 35ft. in circumference. The beds of these blocks were surrounded by finely-ornamented zones of metal, forming a remarkable, if not peculiar feature. The pedestal was of marble, 20ft. in height, and the whole was crowned by a figure of Apollo, attributed to Phidias. This figure was thrown down by lightning in 1150, together with three of the porphyry blocks, and the ruin has since borne the name of the Burnt Pillar. The fine historical column erected early in the fifth century in honour of Theodosius the Great, and covered with bas-reliefs of his victories, was taken down at the close of the seventeenth century.

* The evil so emphatically marked at Constantinople, has been felt in other places, and the sword of S. Paul on the Aurelian Column has attracted the electric fluid on more than one occasion. The danger attending statues exposed at a great elevation, especially those of metal, must have been enormous, and their general destruction seems but the natural consequence of other agencies than time. From the chief source of accident modern monuments are secured by the application of lightning-conductors, but many of our finest steeples remain as unprotected as their prototype the Fire Tower on the Isle of Pharos, built by Socrates, a Cindian architect. It is only probable, indeed, that the Rhodian Colossus of Apollo would have succumbed to the disintegration of its rocky pedestals by repeated shocks of lightning, apart from the earthquake, to which its fall two hundred and twenty-four years B.C. is commonly attributed.

THE INSTITUTION OF SURVEYORS.

THE following is substantially the opening address of Mr. Richard Hall, President of the Institution of Surveyors, on Monday evening last. After some introductory remarks the President said:—

Among the questions now attracting public attention, those relating to the tenure and occupation of the soil have recently assumed a greater prominence. In these days of political excitement, legislative action often follows so swiftly upon the agitation of any particular question that measures which formerly took a generation to ripen are now brought forward with startling suddenness. It is incumbent on us, therefore, as men possessing a special experience in matters pertaining to landed property, to scrutinise attentively any proposal affecting interests in which we are so largely concerned. There are signs that the growing disproportion between the population and the area of the soil may become a source of agitation on the part of those who hold that the possession of land is a necessary condition of individual happiness and independence; and, on the other hand, that its non-possession is a grievance attributable to bad laws and class legislation. Without trenching on political topics of this kind—topics which cannot be too rigidly excluded from our discussions—I may be permitted to say that the minute subdivision of the land in this country amongst the general community would probably tend to diminish the yield of the soil, and a loss would consequently result from such a course. The question of extracting from the soil the maximum of produce is one of the deepest interest to every one. In the application to the land of the principles of modern husbandry; in the careful study and employment of the valuable aids which the science of agricultural chemistry is offering to the skilful farmer; in the redemption, by such means, of such areas of uncultivated lands from absolute infertility; in the more energetic treatment of wet and stubborn soils, by drainage and deep ploughing—a task requiring capital, forethought, and patient waiting for advantages which are not immediate—will be found a better field for the exercise of that philanthropic zeal which seeks the real benefit of all classes, than the raising of strained and exaggerated visions of universal land proprietorship. I may remark also that on such questions as the system of transfer of property, the law of entail, and what is termed tenant right, there is much popular misconception, which it would be well to attempt to correct by placing on record the actual facts concerning them. The comparative merits of large and small occupations is also a matter deserving our careful consideration. The class of small hereditary tenants, which has fallen behind in the modern race of agriculture, is apparently undergoing a process of rapid extinction, and there are various opinions as to the probable effects of this change. Many hold that the conditions of increased productiveness and successful husbandry are vastly improved by the absorption of small occupations, whilst, on the other side, it is contended that society suffers a loss by the disappearance of the classes referred to, who form an element of value in the stability of the country by increasing the number of those enjoying a direct interest in the soil.

After alluding to the ill-fated Rating and Local Government Bills, Mr. Hall said:—

Another measure, the Inclosure Law Amendment Bill—introduced by Mr. Shaw Lefevre and the Home Secretary—met with a fate similar to the Rating Bills, being withdrawn in July. One of the principal objects of the Bill, as recited in the preamble, was, "to make better provision for securing allotments for recreation, and for the labouring poor, upon the inclosure of any land." With this end, it proposed, as first introduced, to set aside one-tenth part of all lands inclosed after the passing of the Act as recreation or poor allotment grounds, the extent of the appropriation to such purposes being limited to 50 acres. This clause, however, was amended, 50 acres being fixed as a minimum in commons of 500 acres and upwards. The Bill was referred to by me in my paper on the "Inclosure Acts and their Results," and was discussed by members on that occasion. The general opinion seemed to be that the proportion of one-tenth was very much in excess, and it is probable, should the Bill be revived in the next session, that this provision will undergo some modification.

Public opinion is, at the present time, strongly directed to the subject of the inclosure of common lands, and as is generally the case with agitations of any kind, the movement is not entirely free from acrimony, and a spirit of injustice towards those who it is presumed have infringed public rights. Vigorous efforts are being made to curtail the rights of lords, and to advance the interests of the com-

moners, and Bills have received the attention of Parliament during the last session having for their object the settlement of several disputes of the kind on a permanent basis. One of these, the Wimbledon and Putney Commons' Bill, met with considerable opposition in committee. This Bill places the management and maintenance of the commons in the hands of a body of conservators; Earl Spencer, the lord of the manor, receiving, in lieu of his rights, a perpetual annuity of £1,200, together with certain other minor equivalents. The annuity to Lord Spencer, together with the expenses incident to the preservation of the commons, are to be provided for by means of a graduated rate of 6d., 4d., and 2d. in the pound rental, leviable upon houses situated within certain defined distances of the commons. Another similar dispute, which has led to long and expensive litigation, has found its solution within the last few weeks. I refer to the well-known case of Hampstead Heath. During the last session, a bill was carried through Parliament, authorising the Metropolitan Board of Works to purchase of Sir John Mayron Wilson, and his successors, the rights which he claims, in fee simple, over the manor. The Board is authorised to raise, for the purposes of the Act, the sum of £75,000, and the amount agreed to be paid to Sir John Wilson, in consideration of his claims, is £45,000. The Board will have the sole maintenance and management of the heath for purposes of public recreation.

Other bills affecting commons and commonable lands, such as the Wandsworth Common Bill, the New Forest Bill (introduced by Mr. Baxter and withdrawn), and the Epping Forest Bill, have been a distinguishing feature of the past session of Parliament. In the latter case, the claims of the commoners, backed by the powerful co-operation of the Corporation of London, are about to be submitted to a jury in the ancient Court of Swainemote—revived, for the first time, after long disuse. The jurisdiction of that Court is repudiated by the lords, who found a claim to refer the matter in dispute to the Attorney-General, upon a statute of George III., so empowering those who insist that their manors are without the forest limits.

The decisions of Lord Hatherley, in August last, in the cases of Warrick v. Queen's College, Oxford, and Betts v. Thompson, will probably have an important influence upon questions of contested common rights. The first of these cases originated in an attempt, upon the part of the authorities of Queen's College, Oxford (the Lords of the Manor of Plumstead), to inclose the common. Thereupon an injunction to restrain them from so doing was obtained, and a suit was instituted in the Rolls Court, which resulted in a judgment for the commoners. The case was heard, on appeal, before the Lord Chancellor, who, after some delay, confirmed the ruling of the lower Court on all substantial points.

Lord Hatherley went minutely into the whole question, with a view to the discovery of a legal origin (if any such existed) of such rights, claimed and exercised, on the ground of prescription, from remote times. Between the years 1809 and 1830, no Courts Leet or Courts Baron had been held, but the entries on the Court rolls, and the bye-laws and rules framed, from time to time, for the regulation of the exercise of those rights by those who had the right to claim them (the lord standing by without interference), were held by Lord Hatherley to be sufficient proof of the existence of such rights. Their possible existence was not denied by the lord, whose contention was, that as it would be impossible to prove that they existed in certain specific persons to be indicated, he was at liberty to deal with the waste of the manor as he thought fit. There being no copyholders of the manor, the case rested upon the validity of the claims of the customary freeholders, on the ground of prescription, to certain rights of "Turbary" and "common appendant." It was decided by Lord Hatherley that there existed presumptive evidence, amounting to certainty, of a legal origin of such rights, in a grant from the original owner of the soil in times beyond legal memory.

It was contended, on the part of the lord, that the rights of Mr. Warrick (one of the customary freeholders, whose case was selected by the Court for a ruling decision) were forfeited by non-payment of quit rent, by non-admission, and non-performance of suit and service; but, assuming non-forfeiture on such grounds, it was admitted that Mr. Warrick's rights were made out. It was held by Lord Hatherley, with reference to this point, that although, under copyhold tenure, such forfeiture would ensue upon non-observance of suit and service, that freehold rights, vested by way of prescription, could not be so forfeited. The non-forfeiture thus affirmed, together with the admission, on the part of the appellants, of such rights, in Mr. Warrick, if not forfeited, was held by Lord Hatherley to be proof of

the existence of a freeholder, having prescriptive rights upon the wastes of the manor.

Authorities were cited showing that the right of "common-appendant" did not arise when it could be proved that no arable land was granted when the house was granted, and previous decisions were referred to which affirmed that in cases wherein the arable lands, in respect of which the right of "common-appendant" was granted, had been destroyed or covered up by building, it was to be construed as an act of abandonment carrying a forfeiture of the right.

In the present case, however, it was held by the Court that the rights of common-appendant were not affected by the existence of such buildings, the non-existence, in the books of the manor, of by-laws and rules (held to be competent authority) to restrain such acts of building being taken as proof of acquiescence or non-interference on the part of the lords as regarded such acts.

The decision is retrospective, applying to inclosures made on the commons in question since the year 1866, when the snit was instituted. The Court declared a legal origin to the rights of the freeholders—the appellants to pay the costs. The second case (also decided in favour of the commoners) calls for no particular comment. These decisions will probably have the effect of raising, in many parts of the country, questions relating to common lands, and may lead, in some instances, to an examination and re-adjustment of many illegal or informal acts of inclosure.

The attention of the members of this Institution has been specially directed from time to time to the subject of the utilisation of the sewage of towns, and papers setting forth the results achieved under different and, to some extent, contrary systems of treatment, have been read at our meetings. Notwithstanding the attention which the matter has received at the hands of both scientific and practical men, there seems still to be much uncertainty as to the probable results of the adoption of any particular scheme, and so much alarm at the contingent expense, as to induce many large towns to shrink from the obligation.

In many of the great riparian towns of the Thames Valley, the clauses of "The Thames Conservancy Act, 1867," and "The Thames Navigation Act, 1870"—whereby the discharge of sewage into the river or its neighbourhood after the 21st October, 1870, is declared to be illegal—have created the utmost difficulty and embarrassment, and, in the last session of Parliament, a bill was promoted by the vestry of the parish of Richmond, praying for a three years' extension of time, on the plea that the whole question was as yet in its infancy and involved in more or less obscurity. The bill was strenuously opposed by the conservators, on the ground that a concession of the kind would create a precedent of which other towns would not be slow to avail themselves, and on the further ground that no serious effort had been made by the vestry to carry out the purposes of the Act. A clause introduced during the passage of the Bill through the Committee of the House of Commons, authorising the vestry to discharge, after deodorisation, the affluent water into the river Thames, was struck out in the Lords' Committee. The three years' extension of time sought by the Bill was not granted; but an undertaking was given by the agent, on behalf of the conservators, holding the vestry free for a further space of two years of the penalties following non-compliance with the terms of the Act. The remaining clauses of the Bill (merely monetary) were passed.

The conditions affecting the adoption of any particular system of sewage treatment in different towns are so varied as to justify local bodies in a good deal of their hesitation in embarking large sums of money in costly works, which may, after all, have to be superseded by others of quite another kind. The differences, also between the several and rival systems are not so much in the cost involved in carrying them out, as radical differences on all points, so that the substitution of one system for another, which time may prove to be superior, would involve an almost total change in conducting agents and plant, as well as in the area and situation of the land required for utilisation. That sewage may be profitably utilised under favourable conditions of supply, and when land can be secured suitable in character, area, and position, there seems to be little reason to doubt; but under no system does this prospect as yet seem to be so assured as to render an indiscriminating application of any of the methods of treatment desirable. Local prejudices, whether well or ill-founded, against the proximity of sewage farms, constitute a very usual obstacle to schemes of the kind. Unfortunately, it is commonly found that, by the very nature of the case, this difficulty is most serious in the populous neigh-

bourhoods of those large towns the sewage of which it is most necessary to deal with.

A measure, entitled "An Act for the Amendment of the Law relating to Ecclesiastical Dilapidations"—under which one, at least, of our members has already received an appointment—calls for some notice on this occasion. This Act, which came into operation on the 1st of last August, enacts that at least one surveyor shall be appointed to each diocese, whose duty it shall be, upon the complaint or application of the archdeacon, rural dean, patron, or incumbent of a benefice, to inspect and report upon the condition of the buildings of the benefice, and who shall, if called upon to do so, furnish to the bishop a report and estimate of the cost of the repairs alleged to be necessary. The bishop is empowered to decide, on the showing of the surveyor, or on anything which may be urged by the incumbent to the contrary, whether such repairs are, or are not, necessary.

The incumbent, in cases either of compulsory or voluntary repairs to the buildings of his benefice, is authorised, upon the security of the possessions of the benefice, to borrow the whole or any part of the sum necessary for their execution from the governors of Queen Anne's Bounty.

The various sections of the Act regulating the surveyors' fees and charges I need not here refer to.

The appointments are held subject to the pleasure of the archdeacons and rural deans of the diocese.

The Act, in principle, compels the possessor of a life interest in an ecclesiastical estate to show that regard to the interests of his successors which, in secular life, is generally secured by the principle of family inheritance. If the Act is efficiently carried out, many painful disputes, and the great embarrassments which frequently result to the families of deceased clergymen, will be obviated.

A vote of thanks was unanimously accorded to Mr. Hall for his address, the business of the evening concluding with the formal proposal and admission of new members and associates.

The Institution now numbers 3 honorary members, 189 ordinary members, and 61 associates, and includes in its ranks of members and associates a large proportion of the leading surveyors and land agents of the kingdom, as well as many barristers and engineers of eminence engaged in kindred branches of practice.

CLASS OF CONSTRUCTION, ARCHITECTURAL ASSOCIATION.

THIS Class, formed to assist the members of the Association in obtaining a knowledge of the practical part of their profession, by means of an organised system of mutual study, has effected great good in the past, and we may confidently say that, in common with the other classes of the Association, its utility will be no less marked in the future. Its results have been so great, indeed, that we would commend to provincial societies and bodies of architectural students the plan of operation pursued in the Class. Questions bearing upon the subject to be treated of in the Class are issued beforehand by its Committee, and a certain number are allotted to each evening on which the Class meets, and the members are required to furnish replies in writing, systematically worked out, to as many as possible. One of these replies is selected at the meeting, read out, and compared with the others. The results are then discussed, and members requested to describe the method by which they arrive at them, illustrating their explanation, whenever practicable, by sketches on the blackboard. This procedure has been found to work well, and a large amount of information has been acquired and disseminated during the existence of the class. To show the nature of the questions in the various subjects, we give those under the heads of "Brickmaking and Brickwork," and "Physics." The first of these subjects was treated of in the Class at the meeting on Friday last; "Physics" is the subject set down for the meeting of the Class on the 24th inst. We hope that by publishing the questions in these and the other subjects as they occur, some of our young provincial students will be stimulated to meet together for mutual instruction in some such way as is done in the classes of the Architectural Association.

BRICKMAKING AND BRICKWORK.—1. Explain the terms "pure clay," "fire-clay," "marl," and "loam," stating how each enters into the composition of bricks. What results are due to the presence of iron, magnesia, or lime in brick earths? 2. Describe the process of brickmaking usually adopted near London. 3. What is the average weight of brickwork in mortar or cement? 4. Required the quantity of brickwork in a 14in. wall, 30ft. long and 15ft. high, above three courses of footings; it has a 1½ brick projection for chimney-breast,

5ft. 4in. on face, the opening being 3ft. wide, 3ft. 6in. high, and 18in. deep; there is also a doorway 7ft. by 3ft., the lintel over being 3in. deep. 5. What is the best method of constructing hollow walls, and how are they measured? 6. Give specification and drawing of a baker's oven. 7. Give sketch of a small ice-well, describing the construction and requirements.

PHYSICS.—1. Three pressures act in the same plane upon a point, and neutralise each other. One is a suspended weight of 180lb.; determine the others, one of which makes an angle of 15 degrees with the horizon, and the other an angle of 150 degrees with the same horizontal line. 2. The rafters of a span-roof are 10ft. long, and rise at an angle of 30 deg.; if the load on the roof be taken at 40lb. per foot super, and the rafters are 12in. apart from centre to centre, what is the strain upon them and upon the wall? 3. In the use of mechanical powers, a gain of force is attended by a loss of speed. Prove this to be the case, and explain what advantage is obtained by their application. 4. Explain the principle on which sound is conveyed. 5. Sketch the arrangement of seats you would consider best for a lecture-room, and state why you prefer it. 6. In constructing a concert-room, what precautions are necessary to render it good for sound?

SANITARY LEGISLATION.

WHAT, asks the *Saturday Review*, is the position of a man who wants to find out whether he can prevent the water he drinks from being polluted by his neighbour's sewage, or the air he breathes from being polluted by his neighbour's chimney? He has first to master some fifteen general Acts of Parliament, in the hope that in one or other of them he will find the power he is in search of. If he fails in this, he must look through some twenty or thirty subsidiary Acts, on the chance that the power may be given incidentally by a clause in one or other of them. If he attains his end, he must examine further whether the particular Act which seems to serve his turn is in force in the district he lives in; and if it is, it is still possible that there may be some local Act which abridges his remedy. When all these dangers are surmounted, it is more than possible that the clause he has discovered turns out to be so defective in the scope of its prohibitions as to be practically unworkable. But, supposing that by some fortunate chance he does light upon the exact clause he wants, and finds that it is in all respects adequate to the occasion, he is not much better off than if his search had been altogether unavailing. His knowledge of what the law forbids will not help him, unless he knows further who it is that the law has charged with the duty of enforcing the prohibition. In some places certain Acts are administered by Local Boards, in others the same Acts are administered by the Town Councils, or by the Commissioners appointed under local Acts, or by the Guardians of the Poor, or by the Vestries. By one set of statutes the Local Boards have authority to act under the name of "Nuisance authorities," and by another set these same Boards have authority to act under the name of "Sewer authorities." "Intricate legal responsibilities," says the report of the Sanitary Commission, "being attached to so many various bodies, or to the same under different names, doubt often has been created as to where the responsibility or power lay, resulting either in inaction, litigation, or frustration of public works already attempted." Until lately this confusion was increased by these several bodies being placed under the supervision of three distinct departments of the Central Government. This defect in the law was remedied by the Act of last session fusing the Poor-law Board, the Home Office, and the Privy Council, so far as their sanitary functions are concerned, into one new department—the Local Government Board; a reform which, indispensable as it was for other reasons, had a special advantage of creating a Minister specially charged with the duty of preparing sanitary bills, at a time when sanitary bills most need to be prepared.

THE NEW COURTS OF JUSTICE.

HAVING given elaborate and exhaustive descriptions of Mr. Street's designs for the Law Courts in Nos. 875 (October 13), 876 (October 20), 877 (October 27), and 878 (November 3), there will be no necessity for us to comment at any length on the several illustrations of the edifice as we give them. This week we give an illustration of portion of the Strand elevation, which was fully described three weeks since. Next week we hope to give elevation and details of public stair of Strand front.

10 20 30 40 50 60
SCALE OF FEET



Public Staircase to Galleries & Court

Public Entrance

Nov. 17th 1871.



Control Hall

Public Staircase to Galleries & Courts

ION OF WEST PART OF STRAND FRONT.

, ARCHT

Fine Arts.

THE FLEMISH GALLERY, ST. JAMES'S STREET.

CROCKFORD'S old gambling-house, at the top of St. James's-street, after passing through many vicissitudes as club and restaurant, followed by a long period of closure and desertion, has just been opened, under the above title, as an emporium of art, under the auspices of Messrs. P. L. Everard & Co., of Brussels, and their associates in Paris and elsewhere, as "a grand exhibition of paintings of all nations"; in other words, a gigantic international exhibition of paintings, conducted upon similar shop principles as that at South Kensington under the exalted patronage of her Majesty's Commissioners of the Exhibition of 1851. There is no mistake about it, and there is no attempt to deny it. Messrs. Everard & Co. are picture dealers, with an immense stock on hand, as is amply testified by the piles of unexhibited works, in and out of cases, which crowd the staircase and the little "office" on the first floor, prepared to take their places on the walls, whenever their predecessors there have found purchasers. Add to this that an announcement on the walls states that any pictures purchased may be removed from the "exhibition" after three days' notice being given to that effect, and we may form an idea of the transitional condition of the collection which is now opened to view on these vast, heavily-decorated, but gloomy and ill-lighted premises. Nevertheless, the stock is worth looking at by those who take real interest in art, and who know sufficient of it to separate the wheat from the chaff. Be it said at once of this vast heterogeneous collection, which threatens every day to be increased in volume (one notorious picture dealer in Paris, for example, having died the other day, leaving some four thousand pictures in his shop, a large number of which will doubtless, one of these days, find their way to London)—be it said we say, and we now say it, that amongst a large mass of absolute rubbish, which the bulk consists of, there are several gems of purest intellectual art, which are worth the seeking for. We may add that the introduction of this large mass of foreign pictorial production, of every degree of merit and demerit, affords for the first time to the amateur and art student an opportunity of forming a fairer estimate of the *status* of art in the Continental schools represented here than he ever enjoyed in this country before, and thereby of drawing a comparison with the performances of native art, and forming conclusions as to its relative position with regard to others. One general observation we will make upon this subject, and that is that, viewing the mass of mediocrities from Belgium and France on these walls, we find in them, as a general principle, a greater amount of power of drawing than in the English school of a similar rank, but put forward in an ostentatious manner, which is far from being conciliatory; whilst in point of colour—both as to the quality and transparency of the pigments themselves, and the manner of applying them—the English artist has a considerable advantage over his Continental neighbours. Amongst the crowd of weak and washy products of these exhibitors—confining ourselves only to a few in the small *genre* style—we may point more particularly to the works of L. Bakalowiez, T. Ceriez, Leon y Escosura, E. Castau, and others, hanging in the lower room; and the visitor will have no difficulty in finding many others equally shortcoming. Of heaviness on a larger scale, take, for example, "A Pompeian Lady," by J. Coomans. But open to severer denunciation is the inexcusable nudity "Le Reveil," by A. Leeadre, which hangs just above the last named, there being in it neither form, nor study, nor flesh-tint to palliate its obvious offence against taste and decency. To turn to more agreeable

subjects, we find in the lower rooms an extremely interesting fragment, containing three figures, of the celebrated picture "The Arrest of the Princes," by Horace Vernet, which was destroyed at the pillage of the Palais Royal, in February, 1848; a fine specimen of Verboeckhoven's elaborate, highly-finished, but somewhat hard style, representing "Sheep Reposing in Landscape;" and a clever interior, with figures, entitled "The Visit," by H. Van Hove. By Gustave Courbet is an immense canvas some 20ft. by 16ft., entitled "The Death of the Stag;" an ambitious but cold and weak performance.

In the upper rooms we are first struck by a very powerful representation of "Torquato Tasso in Prison," by Louis Gallait; the poet's eye fixed in indignant frenzy, whilst his hands, upon which a high light rests, clasp his knee. The composition is a little artificial, perhaps, but the effect is undeniably powerful. Then, in fine contrast to this stirring canvas, we notice a sweet composition, cabinet size, by Rosa Bonheur, entitled "The Repose," a rural scene, with a young woman knitting, whilst she tends her sheep, and a young swain lies at full length, in silent devotion, at her feet. This picture is painted with greater suavity and brightness of tone than is usual with the artist. Madou is represented by two small canvasses, in one of which, "The Courtship," a rustic group, we especially recognise a fine appreciation of humorous sentiment, and an amount of feeling in the execution, beyond which nothing could be desired. Then, close by the last-named, we find an Edouard Frere—a charming little girl, with a large umbrella over her head, paddling along the streets through the rain. A brilliant and highly-dramatic production is F. Roybet's "The Page," representing a young stripling holding in leash a pair of greyhounds, beautifully painted, one of which makes effort to attack a white parrot which stands guard over a plate of fruit. This is a really fine work of its kind. J. Emile Saintin's two pictures, entitled "Flowers of Joy" and "Flowers of Sorrow," representing in the former case a young woman with a bouquet of flowers in her hand knocking at the bed-room door of a friend, probably on her *jour de fête*, in the latter one on a similar mission with a handful of *immortelles*, are well known through the engravings published of them. Both the pictures are here, and, notwithstanding their somewhat *fade* character, command attention by the intense feeling thrown into them. By the same artist there has just been added a work of still higher pretensions, representing a young lady, dressed in black, seated in profile and reading a letter with intense interest and evident appreciation of its contents. The finish of costume, accessories, and all details is of the highest quality. O.

A TEMPTING OPPORTUNITY FOR BUILDERS.

IN the borough of Barrow-on-Furness the house accommodation is now glaringly inadequate for the wants of the population, many hundreds of families being obliged to live in temporary wooden erections, owing to the impossibility of securing other residences. The Mayor of Barrow (James Ramsden, Esq.), on his recent re-election for the sixth time, made use of the following remarks with reference to this subject in the course of his address to the Town Council of the borough:—

"I cannot refrain from alluding to a want, the existence of which I have no doubt has been already recognised by the whole of the members of the Council. I am sure that every one has arrived at the conclusion that the house accommodation in Barrow is even at the present time wholly inadequate to the necessities of its population, and it cannot fail to have struck you that this deficiency will be far more severely felt as that population increases, and it must increase very rapidly to keep pace at all with the requirements for additional labour which the development of the various new branches of industry amongst us must give rise to. It must be borne in mind that not only have we to look

forward to the influx of families who will be attracted by the employment offered to women and children at the flax and jute mills, but that we must prepare for an equally large accession of residents, or perhaps a still greater number, from the establishment of the shipbuilding works and rolling mills. I think we may, without exaggeration, congratulate ourselves that when these works are completed Barrow will be enabled to boast that one of the largest establishments devoted to this branch of manufacturing industry within the United Kingdom is to be found here. I am speaking from a personal knowledge of the circumstances when I say that in these works all the latest and most perfect appliances for meeting every description of work which may fall within the scope of the proposed operations of the company will be found, and that it is difficult to assign any limit to the extent of the business which may be carried on in connection with the undertaking. But here again the all-important question of providing the requisite house accommodation for those who must necessarily be engaged to carry on these great works forces itself upon our consideration. What with the labour needed for those works, and those to which I have previously referred, as well as the increase in our population which must follow the commencement of active operations on the part of the Flax and Jute Company, there is little doubt but that within a period of something like five years the number of the inhabitants of this borough will be at least doubled. All these circumstances, it must be admitted, contribute to show most conclusively that there exists at the present time in the borough of Barrow one of the most promising fields for investment in building operations ever brought under the notice of capitalists. I do not think that it would be possible to imagine any set of circumstances offering greater encouragement to builders and those who may be desirous of investing in house property. They have before them the very welcome assurance that immediately houses are completed they will be tenanted, and they may thus look with certainty for an immediate return upon their outlay, with the assured prospect of improved value in a progressive and flourishing town and port. I feel sure that these facts only need to be more generally known, and the situation of affairs here to be better appreciated, for the want which undoubtedly exists to be supplied. And I am convinced also that the members of the Council, who have, I know, the interests of the town deeply and sincerely at heart, will avail themselves of every opportunity to impress these facts upon those with whom they may be brought into contact in their business or private relations. We must all, I think, be satisfied with the improved position which this borough has attained in the commercial circles of the country, and with the rapidly-extending recognition amongst men of business of the numerous advantages it offers, both as a centre of manufacturing industry and as a port. At the same time we must not close our eyes to the fact that this rapid progress on the part of the borough exacts new duties from those who are charged with the superintendence of its municipal affairs, and imposes additional responsibilities upon them. I am sure you will agree with me that one of the first duties of this Council is that of fostering, by every legitimate means in their power, the progress of the borough, encouraging the growth of its population, and making an adequate provision in good time for those sanitary and other requirements which will assume such a vast importance when the borough of Barrow numbers, as I believe it will in the course of a very few years, its 50,000 inhabitants."

COMPETITIONS.

BEDFORD CORN EXCHANGE.—The successful competitors for this building are Messrs. Ladds & Powell, London. The design was selected from seven sent in, and unanimously adopted by the Town Council.

BRAMPTON.—The designs of Messrs. C. S. & A. J. Nelson, architects, of Leeds and Derby, who are at present engaged in erecting new workhouses for the Brunley and Wharfedale Unions, have recently been selected in a public competition for a new union workhouse at Brampton, in Cumberland. Accommodation is provided for 200 inmates, and the works are to be proceeded with immediately.

LEEDS SCHOOLS BOARD.—At a meeting of this board on Thursday, the 9th inst., the report of the building committee was received and adopted. It stated that in answer to their advertisement for designs for school buildings, fifty-two sets of plans had been received, and that the first premium had been awarded to Mr. George Carson, architect, South Parade, Leeds, and the second to Messrs.

Alexander & Henman, architects, Stockton and Middlesbrough.

PUBLIC ELEMENTARY SCHOOLS, SHARNBROOK.—Eight designs were submitted in competition for this building (one of the first to be erected under the New Education Act), and that by Messrs. Ladds & Powell, London, was selected by the board.

SCHOOLS OF ART.

EDINBURGH.—For some time past negotiations have been going on between the directors of the School of Arts and the City Improvement Trustees in reference to the rebuilding the institution, now in course of being removed from Adam-square. The trustees having, in lieu of the site they have appropriated, granted one on the line of Chambers-street, immediately opposite the Industrial Museum, plans were in due course obtained from Mr. Rhind, architect, for the erection of a new building. Two architects, consulted on behalf of the School of Arts, have given it as their opinion that the execution of Mr. Rhind's plan will involve an expenditure of £8,000. The trustees, however, have not seen their way to offering more than £7,000. The alternative, therefore, remains of modifying the plans or raising the balance of the cost among the friends of the institution.

YORK.—The annual meeting of the subscribers to this school and their friends was held on Tuesday week. Dr. Procter read the report, from which it appeared that the total number of students who had attended the school any time during the year had been 103, the average number being 80. Book prizes had been awarded to nine students, and the result of the Government examinations in May might, under the circumstances, be looked upon as satisfactory. Greater facilities had been given to ladies, and the report contained useful suggestions to all the students. The class of artisans and railway apprentices was in a highly satisfactory condition, and they were carrying out a complete course of education. These facts proved that they had a desire to avail themselves of the opportunity thus afforded to them. There was a balance due to the treasurer of £52 2s. 6d.

ARCHÆOLOGICAL.

A BRITISH BURIAL-PLACE.—Under the direction of three officers of the British Archaeological Association, a series of very interesting researches in what has proved to be an ancient British burial-place, between Feltham and Sunbury, have lately taken place, the expense attending the excavations being very liberally borne by Mr. Thomas Ashby, of Staines. On the two occasions of a very careful examination of the field in which the discovery was first made by Mr. Lennard, a farmer, of Sunbury, no less than some fifteen urns, of unburnt clay, of different sizes and shapes, have been brought to light, and eight of these ancient vessels, containing burnt bones, small fragments of charcoal, and a few flint arrow-heads, successfully taken from the earth, where they have possibly lain for between two and three thousand years. These urns will be exhibited at the opening meeting of the British Archaeological Association, on the 22nd inst., when a paper will be read on the subject of the interesting find by Mr. Edward Roberts, F.S.A., with notes and explanatory remarks by Messrs. George Wright and W. H. Black.

BATH ABBEY.—An interesting discovery has been made during the works now in progress in connection with the restoration of the choir of the Abbey Church, Bath. The workmen have come across another of the massive columns of the old Norman Abbey, similar to those found below the floor in other parts of the building. Near this spot another discovery has been made, that of a vault, which it is not improbable may prove to be that where Bishop Oliver King was buried. Uncertainty has always attached to the burial-place of this prelate, whether in the Bath Abbey or the Chapel Royal, Windsor, and it may prove that the vault just discovered was Bishop King's place of interment.

CHIPS.

The new church at Hadfield, in the diocese of Lichfield, has been entrusted to Messrs. Medland & Henry Taylor, architects, of Manchester. Hadfield is an increasing and prosperous manufacturing village, and dismally wants a church.

The parish church of Overton, Flintshire, was reopened on Tuesday, the 7th inst., after restoration at a cost of about £3,000.

On Saturday, the 4th inst., the foundation-stone of new schools about to be erected in connection with S. Matthew's Church, Stockport, was laid by the Bishop of Chester.

Building Intelligence.

CHURCHES AND CHAPELS.

BIBLE CHRISTIAN CHAPEL, CAMBORNE.—On Monday, the 13th inst., a new Bible Christian Chapel was opened at Camborne, Cornwall. Accommodation has been provided for nearly 700 people. The building contains galleries round the four walls, class rooms are provided on the north side of the chapel, and the minister's vestry is situated behind the rostrum, and under the end gallery. All wood work is varnished: the front of gallery has stencil ornament in the panels. The roof is of open timber work, having circular hammer-beam principals, supported on columns against the walls, the boarding laid diagonally. The total width is about 34ft. in one span, without any direct horizontal ties below the collar, and which required more than ordinary care in the construction, considering that the walls were of usual thickness, only without abutment. We believe this chapel is one of the first erected in West Cornwall having open timber roof. The total cost is about £600, but quantities of material from the old chapel were re-used. The tower, which has a slated spire 70ft. from ground, contains stairs to gallery. The architect was Mr. James Hicks, of Redruth.

CAMBRIDGE.—On Friday last the temporary church in Barton-road, Cambridge, was opened by the Bishop of Ely. The building is of wood, and is a neat and convenient structure, having been built, at a cost of about £100, from plans by Mr. R. Reynolds Rowe, architect and surveyor, of Cambridge, Mr. Charles Hazel being the builder.

EXETER CATHEDRAL.—In addition to the subscriptions already promised towards the general objects of the Exeter Cathedral restoration, several friends are providing for special and separate portions of the work. The middle compartment of the reredos will be provided by Dr. Blackall, in memory of his great-grandfather, Bishop Blackall, and the two side compartments will be furnished by Chancellor Harington. The Chancellor has contributed £4,000 in a lump sum, and besides that and the two reredos compartments (which will cost some £850) he has erected the east window in the Lady Chapel at an outlay of £600, and also gives the holy table, the communion rails, and the litany desk. Mr. E. Force, the chapter clerk, presents the carved stone pulpit, which will cost about £400.

GLASGOW.—A new Episcopal Church, dedicated to S. Mary, has been opened at Glasgow. The church, which accommodates 1000 persons, consists of a nave, 100ft. by 30ft., north and south aisles, north and south transepts, chancel and chancel aisle, with a vestry north of the chancel aisle. The architecture of the building is that of the fourteenth century. The total cost is estimated at £20,000.

GRAVESEND.—S. George's Church, Gravesend, having been closed for some time past for the purpose of alterations and improvements, was re-opened on Sunday. The alterations and improvements, comprising the entire renewal of the fittings in the lower portion of the body of the church, a new font, pulpit, and reading-desk, new flooring, and apparatus for heating the church by means of hot water, have been executed by the contractor, Mr. John Gould, at an estimated cost of about £550.

LAWHITTON.—The Parish Church of Lawhitton, Cornwall, was reopened on All Saints' Day after restoration. Besides the rebuilding of decayed walls and the restoration of old fractures in the stone work, the present work has included an entirely new nave and south aisle roof. The new south aisle roof is of the ordinary kind of Cornish waggon roof, but the nave roof is of a more unusual character, the design being founded upon a beautiful specimen of fifteenth century woodwork, existing at Trearrell Hall, in the adjoining parish of Lzant. This roof has curved moulded principals about five feet apart, with moulded purlins dividing the intervening spaces into square panels, over which are smaller diagonal ribs, with carved leaves at the intersections. The east window of the chancel is new, of five lights. The other new works are, an oak screen, with cusped front, at the entrance to the chancel, new pavement to chancel and nave, and nave seats, where the old ones were too decayed for re-use. The works have been carried out under the superintendence and from the designs of Mr. J. D. Sedding, of Bristol and Penzance, the contractors being Messrs. Stacey & Son, of Lawhitton.

LEEDS.—The new church of S. Augustine, Wrangthorn, Leeds, has been consecrated. Mr. James Fraser was the architect. The church is in the early fourteenth-century Decorated Gothic style, and consists of a nave, with north and south aisles,

chancel, and side chapels, the latter in the position of transepts, but roofed parallel to the nave, thereby allowing the clerestory windows to run through to the chancel arch from the west end. The chancel is provided with two vestries on the north side for the vicar and choir. Accommodation is provided for nearly 700 worshippers in open pews. The edifice has cost about £6,800. The nave is separated from the aisles and chapels on each side by an arcade of five arches, double splayed and carved, having labels overstopped by carved heads representing the Apostles, with a shield below each bearing the emblems. These arches are supported by circular polished red granite columns with moulded bases above the seats. The caps are moulded and richly carved with natural foliage. The clerestory is pierced by ten single-light windows on each side, having traceried heads, and deeply-splayed stone jambs and sills, with a moulded string-course underneath. The aisles are lighted by traceried three-light windows. Each chapel is lighted at the side by two three-light traceried windows and by traceried windows in the gables. A richly-traceried five-light east window and two-light side windows light up the chancel. The roofs are open-timbered. The altar is of pencil cedar, and is richly ornamented. It is arcaded. The font is of Caen stone, is elaborately carved, and is enriched with marble shafts.

LITTLE BARFORD.—On Tuesday week the parish church of Little Barford, Hunts, which for the last three years has been under restoration by Mr. W. Osborne, builder, of St. Neot's, was opened for public worship by the Bishop of Ely.

LIVERPOOL.—The new church of S. Anne, Liverpool, was consecrated yesterday. Early in 1869, plans were prepared by Mr. Robson, then the architect of the borough; and the contract for the works was taken by Mr. Hugh Yates, of Bute-street, Fox-street. The structure, which is in Great Richmond-street, is in the Mediaeval style, with red brick facings dressed with red sandstone. The entire length of the church is 137ft., including the chancel; breadth, 52ft.; height of nave from the floor to the apex of the roof, 53ft.; and it is estimated to accommodate about 670 persons. On the north-west side a tower has been erected 95ft. in height, surmounted by an ordinary weather vane. On either side of the nave are five arches of 16ft. span, formed of red sandstone, with plain moulded caps, the pillars being alternately round and octagonal. The elaborate decorations have been executed on the walls of the church by Messrs. Cottier & Co., Langham-place, London. These, which are all in stencilling, completely cover the walls of the church. Messrs. Jones & Willis, of Birmingham, supply the altar cloth and sanctuary curtains. The cost of the erection will be about £7,000.

PORTBURY.—The nave and chancel of the church of Portbury, near Bristol, have been restored. The chancel was restored by the Ecclesiastical Commissioners, under their architect, Mr. Christian. The roof is of oak, and that of the nave of pitch pine. In both cases the style of the old roof is retained. Stone tiles have been used on the outside, in place of the old lead covering. The cost of the nave was about £1,300, and of the chancel £700. Mr. J. W. King, of Clifton, was the builder.

S. DENT'S, BARFORD PARVA, BEDFORDSHIRE.—This church was reopened on the 7th. It is in the Transitional between the Early English and Decorated style, with tower, north aisle, and chancel; the chancel has been rebuilt, and aisle and vestry added on the south side, one of the arches of which is partly built up to form vestry and sedilia; there is a credence in the south wall; in the east end there is a triple-lancet window with stone shafts, caps and bases, and mullions and marble shafts to inside arch, and the window is filled with stained glass (by Messrs. Clayton & Bell) representing the Birth, Crucifixion, and Ascension, &c., of our Saviour. The reredos is mosaic work, and the space in each end of the altar-table and floor is covered with handsome tessellated paving; in the chancel arch is a low stone screen, surmounted by an iron screen, and forming gates (by Mr. W. Shrivell); Mr. Arthur W. Blomfield, M.A., is the architect. The windows, doors, seats, &c., of the church have been restored, the roof boarded and formed into panels and varnished; the surface of the floor is laid with six-inch blue and red Staffordshire tiles (Peake's); there is at present no pulpit. The altar-table, choir-stalls, seats, and all the work (except the stone work) has been done by Mr. W. Orton; the stonework by Mr. W. Wade, both of S. Neot's. Bath stone and Casterton stone for building; Mansfield for steps. The four east bays of chancel roof are handsomely decorated by Messrs. Heaton, Butler, & Bayne.

SWALLOWFIELD.—The church of All Saints', Swallowfield, Oxon, was reopened on All Saint's Day, after restoration from the design of Mr. J. Morris, of Reading, by Messrs. Wheeler, of Reading. The church is an ancient structure in the shape of a simple parallelogram, 86ft. by 25ft. wide, and was built during the Norman period. As the chancel walls were very dilapidated, it was determined to rebuild them, and whilst pulling them down the old Norman windows which now occupy the east wall were discovered. The north door, with its zigzag mouldings and shaped jambs, is a very fine specimen of the period. There is no chancel arch, and the chancel differs from the nave simply by having arched rafters in the roof, whilst the roof of the nave has tie-beams and trusses with straight rafters. In 1836, a transept or pew was erected upon the north side of the church by the late Sir Henry Russell, under which is the family vault. This part of the building scarcely accords with the style of the church. This transept is faced externally with stone, whilst the remainder of the church is flinted with white mortar joints and stone dressings. A handsome reredos has been executed by Mr. Earp, of Kennington-road, from the architect's designs. It consists of a Norman arcade (to correspond with the east window), wrought in Caen stone, and relieved by red marble shafts and alabaster bands, with zigzag mouldings delicately carved; the central panel is wider, with a trefoil head, and is filled with a subject representing the institution of the Lord's Supper. The old oaken south porch is being restored, but this portion of the work is yet incomplete.

WEST BROMWICH.—On Friday the foundation-stones of a new Wesleyan Chapel, situated in the Moseley-road, were laid. The main block of the chapel building, which occupies 58ft. by 84, contains sittings for 500 persons, 20 inches being allowed for each sitter. The gallery is round three sides of the chapel. The style of the main building is Italian, and it is executed in Birmingham pressed bricks, with stone dressings. The front elevation has a frontage to Moseley-road of 68ft. and an elevation of 46ft. The cost of erection will be £4,325. Messrs. Loxton Brothers, of Wednesbury, are the architects, and Mr. James Chappelle, of Willenhall, the builder.

BUILDINGS.

BINGLEY.—The new schools built in connection with Holy Trinity Church, Bingley, were opened on Saturday last. They have been built from the designs of Mr. Norman Shaw, of London, and are in the same style of architecture as the church—the earliest type of Pointed Gothic—and are calculated to accommodate about 350 scholars. They have cost upwards of £1,300.

BRIGHTON.—A new hotel (the Clarendon) is nearly completed at Brighton, on the Grand Junction Parade, from the designs of Mr. J. Giles, of Craven-street, Strand. The style is Italian, and is executed in Portland cement, with balustrade above the blocking, broken by ornamental dormers, which fall back into the Mansard roof; the ridge has open ornamental iron crestings. On the ground-floor the whole length of the back front is occupied by a refreshment bar. Facing East-street will be a number of shops in connection with the hotel. Mr. Rankin, of Shepherd's Bush, is the builder.

BRIGHTON.—The works in connection with the Royal Pavilion are progressing. The royal stabling, or eastern court, is being made into a free library and museum, from the designs of Mr. Lockwood, C.E. The style is Moorsque. The building consists of entrance-hall, on each side of which are large rooms. In communication with the hall is a central gallery, on the east side of which are the library and reading-rooms, and on the west, rooms for museum. On the upper floor are a lecture-room and five large museum-rooms. The cost will be about £6,300. Messrs. Cheesman & Co. are the builders.

CORTACHY CASTLE.—Additions, the cost of which will exceed £25,000, are at present being made to Cortachy Castle, the seat of the Earl of Airlie. Part of the old castle, including the entrance-porch, has been taken down. The original style of Cortachy Castle was the old Scotch; the additions are to be constructed in the old Scotch baronial fashion. They include an entrance-hall, measuring 40ft. by 20ft. on the west of the building, to be paved with black marble, and finished with oak. On the same floor are the steward's-room and the chapel on the north-west front, and also a billiard-room at the north-west corner. On the elevation plan the principal feature is a tower, which rises from the back to a height of 120ft. including the spire. The tower is intended for a museum. There is also a clock tower of smaller dimensions than the other. On either side of the clock are the

bulls—the arms of the family—the blocks of stone for which weigh about eight tons each. The front of the new building is ornamented with turrets, corbels, tympanum windows, &c. The architect is Mr. David Bryce, Edinburgh, and the contractors are—for the mason work, Messrs. Hall & Murray, Galashiels; for the joiner work, Mr. J. R. Swann, Edinburgh; and for the plumber work, Messrs. Wallace & Connell, Glasgow.

KEIGHLEY.—Considerable extensions have recently been carried out at the Dalton Mills, Keighley, from plans by Mr. Sugden, architect, of Leek. The style adopted is Roman-Italian, and the works comprise a new mill, six stories in height; a spinning-shed, 250ft. by 47ft.; a boiler-house, 53ft. by 58ft.; a new engine-house, 39ft. by 80ft., and 50ft. high to ridge of roof; a new chimney, 150ft. high, and new offices. The whole of the works were executed by local contractors.

MANCHESTER.—The foundation-stone of a Sunday school in connection with the Primitive Methodist denomination, in Chapel-lane, Quarry-hill, was laid on Monday. The cost of the undertaking, including the site, is estimated to be about £1,200. Mr. Wm. Horrox, of Meauwood-road, is the architect. There are two floors. The lower one contains two classrooms, a library, an infants' room, a lecture-hall, and a refectory. The upper floor consists of one large room, capable of accommodating 500 children. The building is 60ft. long, 30ft. wide, and 48ft. high.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

RECEIVED.—J. & G.—J. H. & Co.—G. M.—J. P. S.—C. B. A.—J. W.—S. S.—C. F. C. A.—C. M. & Co.—J. B.

AN AMATEUR DECORATOR.—Your query is an advertisement.

C. H. T.—The names of the successful competitors for "Sketchbook" were given on March 19 of this year. It is not intended to publish another book on the same conditions, or, at all events, not at present.

F. & T. W.—The first of several of the designs for the New Law Courts is given this week. We hope to give another next week.

Correspondence.

ARCHITECTURAL HERALDRY.

To the Editor of the BUILDING NEWS.

SIR,—Amongst the accessories and decorative details in Early Gothic edifices, all of them (with rare exceptions) possessing strong claims for admiring attention, there are none that are certain to be regarded with such deep interest as the shields of arms and the other heraldic insignia and devices with which the Mediaeval masters of Gothic art delighted at once to enrich and to adorn all classes of their works. I use the word "enrich" advisedly, and with the intention not merely to denote enrichment by appropriate and attractive ornamentation, but rather to indicate that far higher and more excellent, because infinitely more precious, enrichment which is conveyed through endowing a building with such historical attributes as are at once most comprehensive and pre-eminently significant. And this is what heraldry, the trusty handmaid of English history and the faithful ally of English Gothic architecture, does for our Gothic buildings. This, also, is what nothing else can do for them with any approach to the same felicitous effectiveness, and what heraldry itself refuses to do for buildings that are not Gothic.

In the old palmy days of Gothic architecture, when the great style grew up in early strength and vigorous beauty, the historical heraldry of England also arose with it, and the two illustrious contemporaries in closest alliance together attained to their full maturity. I do not affirm, indeed, that the early English heralds were also early English architects; but, while I firmly believe them in at least some degree to have had a loving knowledge of the Gothic architecture of their day, I do not hesitate to assume it to be beyond question that the great Gothic architects of Mediaeval England were good heralds. The heraldry of our old buildings declares itself to have been an integral element in their

design. In them heraldry and architecture were by far too intimately blended to admit the supposition that the architects of those times, themselves ignorant of heraldry, were content to entrust the armorial features, even in the most important of their compositions, exclusively to a distinct class of scientific artists. In all probability the early Gothic architects at times may have consulted professional heralds; or the more eminent architects may have had some members of their own staff whose special attention had been devoted to heraldic studies, and whose special duty accordingly it would be to take cognisance of their architectural heraldry. Still, there can be no doubt of the fact that in the great architectural era now long passed away, a sound knowledge of historical heraldry was a qualification without which the education of an architect must have been esteemed incomplete. Not the least remarkable feature in that revival of Gothic architecture, which in both importance and interest is second to no other incident in the history of art in our own age, is the prevailing failure amongst practical students of the Gothic style to recognise the value of the Gothic heraldry as an element of that style, and, as a natural consequence of that failure, their general neglect of heraldry altogether. I have a well-grounded suspicion that but a very few of even our most eminent living Gothic architects would claim a corresponding rank as heralds. Amongst our younger architects I have the good fortune to have some knowledge of several gentlemen of distinguished ability and the highest promise; but I question whether architectural heraldry, as a rule, could be reckoned amongst their professional accomplishments. And, in like manner, it is but too true that heraldry has yet to seek for admission into the recognised curriculum of architectural study. Now, I am disposed to believe that whatever failures and shortcomings may have cast a shadow over our revived Gothic in no slight degree may be traced to the absence of a genuine heraldic feeling in so very large a proportion of our modern Gothic buildings; and, when our Gothic architects have been most successful in almost every instance, I am convinced that they would have attained to a still higher and grander success had they been as strong in heraldry as in architecture—had they felt and worked, like their brethren of the olden time, in a spirit at once thoroughly heraldic and truly architectural. If the early Gothic architecture was so deeply indebted to heraldry, as well for very much of its most characteristic and most beautiful adornment as for its faculty of historical record and expression, surely it is but reasonable and consistent to suppose that in the revival of the style the heraldic element would retain its original powers, and therefore would be esteemed and valued and applied as of old. It may be, indeed, that the prevalent neglect of heraldry in connection with revived Gothic architecture may have arisen from a vague idea that all historical heraldry had long ago become a thing of the past, and in fact that, having declined with Gothic architecture when the "great dynasty" of the style fell, historical heraldry had fallen with it, and had died out. But, unless Gothic architecture actually died when it sunk to sleep in the sixteenth century, so that its revival, however desirable and desired, must have been a positive impossibility, assuredly the lesson conveyed by the close fellowship between the fortunes of the Mediaeval Gothic and Mediaeval heraldry ought to be that, so far as architecture might be concerned, the revival of the one should have been associated with the revival of the other. If they arose together, culminated together, always working together in happy unison, and then together sunk into decline—surely they ought again to arise together, and together to work once more in the true spirit of their ancient alliance.

I am induced, sir, to address you on this subject at the present time, in consequence of there being now in existence and in a position of unusual prominence a rare opportunity for enhancing both the dignity and the value of a great national edifice by means of historical heraldry; while at the same time the true intrinsic value of architectural heraldry and the felicitous results of a close alliance between architecture and heraldry may be most effectually vindicated and exemplified. If any building in the realm ought to be emphatically distinguished by characteristics at once national and historical, that building is the New Law Courts. It is a building that ought to be strictly English and pre-eminently historical of England. The New Law Courts, consequently, ought to be most richly endowed with that architectural heraldry which is English history written in architecture. As a matter of course, the able and accomplished architect of the New Law Courts has yet to work out in his design such details as may fairly be expected to comprehend the entire range of the

historical heraldry of his immense pile of building; hence in your recent notices of Mr. Street's designs (I have been enabled to study them carefully), however full and comprehensive, you could not well introduce any reference to the heraldry that may eventually be included in those designs. I observed a small series of shields (mentioned by you), at present without armorial charges, within panels in the central part of the design for the Carey-street front of the building; and I infer, therefore, that the subject of heraldry in connection with his designs will not fall much more fully to engage Mr. Street's attention; still I trust that he will pardon my advocating in your columns the supreme importance of heraldry in the New Law Courts, and also my briefly suggesting some of the duties which might be entrusted to it there. When working out the details of his designs for the palace of the Parliament, Sir Charles Barry evidently felt both the value of heraldry in Gothic architecture and also the extreme fitness of its habitual presence in such a work as he had then in hand; but, unfortunately, the heraldry which, with the best of intentions, found its way into the new Houses of Parliament was not altogether such as to render its presence a subject for unqualified satisfaction. Thus, the New Law Courts is the first national building of the first magnitude erected in London since the Gothic revival, in which architectural heraldry will have been enabled to expatiate freely under conditions unexceptionably favourable. May such an opportunity be made available to the utmost, thoroughly, heartily, in the right spirit and in real earnest!

In such a building as the New Law Courts architectural heraldry may be considered to have a threefold field for its action; that is, it will gather rich historical stores from the past; it will be an historian of the present; and it will provide for the continuity of its chronicles in the future. In the first place, with regard to the present. And here I would observe that in the few suggestions I am about to make, where I am not strictly following the guidance of early heraldic examples, I shall endeavour faithfully to be influenced by the spirit of early heraldry. The building, then, ought to record its own era by the becoming display, repeated whenever and wherever right and desirable, of the armorial blazonry of the reigning sovereign, and of the different members of the royal house now living. With this regal and royal armoury should be associated the insignia of the highest personages now holding office in the State; those of the heads of the different departments of national law and justice and jurisprudence; and those of the most eminent legislators, lawyers, and pleaders of our day, that they all may have their becoming places in the contemporaneous heraldic record, and also may discharge their own proper duty in marking for all time to come the era of the edifice. In the second place, in dealing with the past, the architectural heraldry of the New Law Courts would take a far wider range. Commencing with Richard I., on whose second great seal appears the earliest of the royal shields of England, it would include the insignia of the successive sovereigns under whom the laws of England have been enacted and justice administered; and this regal heraldic chronicle would form a single independent continuous series. Derived from this regal chronicle, in distinct groups, other series would display the insignia of each sovereign associated with those of the chancellors, and of the most eminent judges and lawyers of their respective reigns. Again, the shields of arms of the Lords High Chancellors of England would form another distinct series; and the same may be said of the judges of the several Courts, and of the men who, without having occupied the judicial bench, may have played distinguished parts in connection with the administration of the law, and may have done good service to their country. Nor should the foremost legislators of past times be forgotten, or find no place in the heraldic chronicles of the Palace of Law and Justice of to-day; far from this, their shields of arms would form other distinct series, and they might also be grouped with the shields of the sovereigns, and of the high legal officials of each reign. And once more, pre-eminent heraldic honour might be accorded to pre-eminence in worth, in the case of the few individuals who may be entitled the heroes of their profession. And the same remark may be applied to the law societies and institutions founded in the past, and flourishing at the present, which are deservedly held in high honour. More full details are unnecessary; but it may be well to observe that in the suggested groupings precedence and chronology would exercise their proper influence. The display of the heraldry of both the past and the present, it scarcely needs to be added, would gain very greatly in impressiveness, and also in suggestive power, through provision being duly made for carrying on the heraldic record with the

advance of time, a becoming care being taken that the chapters emblazoned after the architectural completion of the building, should be readily distinguished from such as had preceded them. Without attempting to indicate the various positions throughout the New Law Courts in which architectural heraldry might consistently be introduced with the best effect, I will merely propose that in the panels below the lights of the oriel windows in the rooms of the Lord Chancellor, and of one (as an example of the rest) of the judges there should appear in the former the royal shield of the sovereign reigning, and the personal shield of the Chancellor actually in office, and in the latter the same royal shield with that of the judge who first should occupy officially that particular room; of course in the case of the Chancellor's oriel there might be added some significant heraldic accessories.

In conclusion, permit me, sir, to repeat, the architectural heraldry I am so anxiously desirous to welcome in the New Law Courts would prove a most powerful agency to impress upon the building the character of English nationality. The Gothic of Mr. Street's designs is true English architecture—exactly the right architecture for a grand civil edifice in England at the present time—in an especial sense, too, the right architecture for the New Law Courts through its harmony with the Gothic as it flourished in England in the reign of that great prince and wise administrator, Edward I.; and this architectural heraldry is English history expressed in such architecture in such a building. Notwithstanding the skill and judgment with which Mr. Street, in his designs for the New Law Courts, has brought down the Edwardian Gothic from its own era to that of Queen Victoria, and, while maintaining its intrinsic truthfulness, has used the style as an architectural exponent of existing sentiments, requirements, and usages—notwithstanding these things, it is but too true that there are those amongst us who cannot understand, and who will not allow themselves to recognise, what is true English architecture; while others are content to propose that the most national of English buildings should be designed after some foreign type. But better times are surely at hand, when even the leading journal, having discovered the Halls of Westminster and Eltham to be within 100 miles of Printing-house-square, shall have ceased to imagine the Gothic to exclusively an "ecclesiastical" style; and the *Graphic* shall wonder how, inspired by the *Times*, it could have offered "Suggestions for the New Law Courts" of London in the shape of very pretty wood-cuts of certain particularly un-English Hotels-de-Ville in Belgium. In those better days, the Gothic architecture of England having been understood and appreciated, true historical architectural heraldry will be understood and appreciated with it, and therefore no longer will need any friendly advocacy.—I am, &c.

CHARLES BOUTELL.

ASPHALTE ROADWAYS.

SIR,—No. 2 of Mr. Hayward's report I have read in your paper of the 10th instant. Does it not strike you as rather odd that in speaking of the comparative cost of granite and asphalt, he omits to charge against the latter the daily pay of men to cleanse the surface with "squeegees" and the cost of them, which, being of vulcanised indiarubber, are not bought at the price of birch brooms. He also omits the expense of sand, and the labour in distributing it. Now I submit for seventeen years, or rather twenty-one—for he singularly calculates the material to last four years beyond the seventeen for which a limited liability company guarantees it to do so—that some thousands of loads will be consumed at a cost, the very least, including cartages, of 5s. 6d. per yard cube. He also omits to calculate interest and compound interest upon the item annually paid for maintenance.

Do you know why he should jump to the conclusion that the asphalt will endure, without the need of repairs, for four years beyond the seventeen; and how can he confidently make any comparative statement of cost until the City, as in the case of granite, has been called upon to pay the real cost of a repair?

I notice his report is to be continued. I have no doubt he travels West at times (or the West has travelled to the East with the information), and will state the number of times the roadway in Holborn opened for traffic on the 1st of August, 1870, has been repaired. I am aware the situation is "without the City," as are the roadways in Paris to which he alludes; still facts are stubborn things, and whilst I hope, stating them, he will no doubt not conceal the present condition of it, and from inquiries of the foot-guards blue, and other trustworthy sources,

make some mention as well of the feats of horsemanship, in harness and otherwise, that daily block the thoroughfare, and afford a very questionable entertainment for passers-by, both man and horse.—I am, &c.,
A CONSTANT READER.

November 14, 1871.

P.S.—I once inquired of a cabby how he liked the new pavement to drive over. "Like it, sir?" was his reply; "I should like to have the cove's head under my arm that put it down."

BRICKMAKING.

SIR,—I was considerably interested in the article on "Brickwork" in last week's *BUILDING NEWS*, and as I have partly entered into that line of business, and am desirous of producing an article "worthy of the name," I should feel much obliged through your journal for a little more information on the subject. I entered on the business without much practical knowledge in "brickmaking," but understand the art of building, and the selection of good materials, being owner of a piece of land which contains a fair sample of brick-clay about 7 feet in thickness (underneath which is sand suitable for building purposes when sifted). The sample of bricks produced in the neighbourhood being poor, I wished to have them improved. Our first attempt, I am sorry to say, was no improvement on the old system. The clay was only cast in the spring (which was a dry one) so that there was not time for it to get properly tempered; this I blamed in a great measure, as the bricks grew considerably better towards the end of the season. We burned them in clamps, commencing with a series of "drains" at intervals, which we filled with round coal; after this came layers of bricks and small coals alternately. The clamp was about 80 bricks broad and 20 courses deep; when from 20,000 to 30,000 bricks were placed in the kiln we commenced the fire, and as the fire kept advancing fresh piles of bricks were added. The quantity of coals used was 7 cwt. per 1,000. The bricks in general were very well burnt, except in two or three places where we had some large circular bricks (suitable for walling wells with); at those places too much air had got in, and caused some to be too light-burned for general purposes. In moulting some were done by the wet or slop system, and others by sand. I prefer the sand-moulded bricks; but I noticed that when there was much rain the sand-made bricks *washed* considerably more than the slop brick. Our first mode of drying was to spread the bricks on a floor or bed, which we sprinkled a little sand over. After being sufficiently dried for handling they were placed in what we call "walls" (which you seem to call "hacks"), and when dry enough were kilned. I observe that the drying is a very particular point, for when they are thoroughly dry less fuel will do, and the kiln will burn better. It is too much to expect a "clamp" to both dry and burn. The price I pay for labour complete is 11s. per 1,000.

I have thus given a brief outline of our system of brickmaking, which is the general system followed in the North, except a very few places where they are burned in kilns.

I observe in the article referred to that it is recommended that the "fuel be incorporated" with the clay either during the time of casting or tempering. As I suppose a good deal of sifted ashes are used in the South for this purpose, I wish to know if small coal will do in the same way, and if so, what size the coal should be reduced to? I presume they should be *very small*, or they might leave holes in the brick when burnt out. In my case 7 cwt. burns a thousand; is it supposed that I could get a better burned brick by mixing, say one-half the above during the time of casting or tempering, and adding the remainder (3½ cwt.) after in alternate layers for burning? In the system of moulding referred to in page 342, what size are the pallets? Are the bricks turned into those from the mould, do the bricks remain any time on the pallets, or are they sufficiently stiff to be set on the hacks at once? Do they require any more removing before being dry enough to kiln? Is this plan or the "floors" considered better? Hacks will not be so liable to damage by the weather if suitable covers are provided. How wide are the hacks generally made? What are the means used generally when partly dry for "dressing, removing imperfections, and sharpening the arrises?" What is the general plan used in counting, or ascertaining the number in a clamp kiln? I have carefully computed a cube yard, which contains about 321, and by cubing the whole kiln appears to me to be a fair way of checking the contractors' count.

Hoping I have not encroached too much on your time or space, I am, &c.,
RUSTICUS.

Cumberland.

THE SOLOMONIC MONOLITH.

SIR.—I observe a paragraph going the round of the papers anent a half-worked monolith said to have been discovered in the grounds of the Russian Pilgrims' Monastery outside the walls of Jerusalem, and which was believed to be a column intended for the decoration of the ancient Temple of Solomon. Now, although you also quote this at page 360 amongst your "Chips," I do not suppose you mean anything particularly serious thereby. To me it seems that this pseudo-Solomonic monolith is merely a Freemasonic squib got up by some enthusiastic brethren who have more zeal and credulity than discretion and knowledge. Possibly they may have been led astray by the late reprint of the old 1728 Constitutions of the Freemasons, wherein we are told that Solomon's Temple had "1453 columns of Parian marble, with twice as many pilasters, both having glorious capitals of several Orders!" and they immediately jumped to the conclusion that this monolith was intended to have been one of the "1453." It is not stated of what "order" this monolithic column is supposed to be; but as I recently observed in a Freemasonic paper that Solomon's Temple had "double rows of white marble Corinthian columns"!!! it is possible—may I not even say probable?—that this monolith was intended to have been one of these Solomonic Corinthian columns? (!) Of course some of your readers may feel some chronological difficulties in the matter, but if they are good Freemasons these little difficulties, I have no doubt, will soon be got over. In this same reprint I find it stated that King David gave the Masons a charge, "as Euclides had given them before in Egypt!" while in the editor's preface, dated 1871, we find it seriously stated that the method of recognition now in use among Freemasons is the same as was in vogue at the period of the building of the Tower of Babel! Oh, dear! When will Freemasons begin to learn to talk, or at least to write, common sense? So far as my experience goes, notwithstanding all their bombastic and mysterious pretensions of knowing more about the rise and progress of architecture, or "Masonry," as they presume to call it, than other people, they know far less. I do not consider that all the Masonic works in the world put together contain one-half so much real information about architecture or operative masonry as the last volume of the BUILDING NEWS.—I am, &c.,

VERITAS.

KIMBERLEY v. DICK & WHITE.

SIR.—In your report of the judgment given at the Rolls Court on November 3, in the case of Kimberley v. Dick and White, you state that "Lord Romilly decided in favour of the plaintiff." His lordship did not decide in favour of the plaintiff; in fact, he decided that the contract must be confirmed. An account is to be taken in chambers of what is due between the parties on this footing, and meanwhile the case stands over.—I am, &c.,

WILLIAM WHITE.

30A, Wimpole-st., W., Nov. 14, 1871.

ARTIFICIAL STONE AS A BUILDING MATERIAL.

SIR.—In answer to your correspondent "R. A. X.," I beg to state that our material is formed in every respect similar to ordinary cement concrete, but with this exception, that in all cases calcined materials are used.

The arches, lintels, &c., at Messrs. Waterlow's factory were formed of Portland cement and breeze (or refuse from gas works); this we find to be admirably suited to the purpose, but burnt clay, clinkers, or any other similar material may be used. With regard to fireproof construction, I am of opinion that the material is sufficiently non-conducting to prevent the iron getting so hot as to cause any perceptible expansion. I think there can be no better proof of this than has been shown at the late fire, where our girders run through the whole of the front, *i.e.*, about 100 feet, and although the heat was intense, they still remain quite perfect, as may be seen upon inspection.—I am, sir, yours most respectfully,

MATTHEW ALLEN.

Tabernacle-walk, E.C., Nov. 15, 1871.

PLANNING HOUSES.

SIR.—Your correspondent "H." thinks it "scarcely within the province of the editor of this paper to state the exact number of rooms which a gentleman may require in his residence" (!) It appears to me, sir, you are as likely to know as any other gentleman. And these are the particulars an architect must generally receive from his employer. I would

not advise limiting the area, for that is a condition in actual practice not likely to arise. I beg to recommend that the principal rooms be named, and roughly, their sizes, say, dining-room, drawing-room, library and billiard-room, all on the ground floor, and leave the arrangement and number of rooms in the offices (to be also on the ground floor) to the designers. It would be a pity not to have a first-floor plan, and, indeed, it is well-nigh necessary, for a good-looking ground plan often works badly above stairs. The perspective proposed, I think, should be optional; most, no doubt, will willingly send it. I should advise that the designs be sent in with name of author subscribed, one of the most ridiculous as well as vicious points in ordinary competitions being the affectation of secrecy by putting mottoes; also that the drawings be exhibited at the office of the BUILDING NEWS, and the competitors be made the umpires. That each shall send a short criticism of every design but his own. These remarks would, digested, be useful as an accompaniment to the designs published. The honour of the thing, would, no doubt, have been sufficient to ensure a good number of designs without the premium offered; but as, sir, you have been so kind as to give a supplementary inducement, no doubt the invitation will be well answered and considerable benefit ensue.—I am, &c., M.

SIR.—With regard to the BUILDING NEWS Villa Competition, everybody must allow that the idea is a thoroughly good one, and, like the Sketch-book Competition, is calculated to be productive of great interest and usefulness to the readers of your already valuable journal. It, however, will be a competition in which the very juniors of the profession will scarcely take part.

It seems, therefore, a fitting time, especially as you are inviting remarks on this matter, to bring before your notice the custom that prevailed in the office in which I served my articles—*viz.*, the holding of office competitions. The practice may be usual in some offices; but it cannot be too general, considering the great good which can be derived from it. In our case at reasonable intervals suitable subjects were chosen, formal conditions prepared, and prizes consisting of architectural books were offered. Every competitor got out a regular set of working drawings, including perspectives, with specification and report, all the work incurred being done at our own homes and in our own time. When the decision was made known to us the plans were publicly criticised, the merits and failings of draughtsmanship, as well as of plan and architecture, being pointed out to us. In awarding the prizes our principal took into consideration the time each pupil had been in the office. I need not expatiate on the advantages accruing to the young student by such a practical system; to every one they are obvious. Pupils to whom office competitions are foreign will do well to bring the matter before their teachers; and architects who have undertaken the education of pupils, as one means of fulfilling their duty cannot do better than introduce similar competitions into their offices. Trusting I have not overtasked your indulgence, I am, &c., M. B. A.

Brighton, November 13, 1871.

SIR.—I quite agree with your correspondent "H." as to the great value of your late Sketch-book Competition, and think the proposed one for planning a gentleman's house will be equally useful.

I would suggest that the competition be conducted, as far as practicable, on the liberal principles enunciated in an article on competitions in one of your previous numbers, advocating the giving the least trouble to, and using the least time of, the competitors, consistent with attaining the object sought; the sending perspective views (for if one sent, all must, to be equally represented) would only be likely to take away the competition from its first basis—that of good planning.

The difficulty of the necessary inequality of cost in the plans submitted might amply be met by giving in your conditions a list of the chief rooms, not to be exceeded in number, with their approximate area, and specifying any special accommodation required; this would be similar to what an architect would receive from a client, and as no two clients would require precisely the same, no two architects would be likely to put the same rooms; each, perhaps, appropriating some to different purposes to those of the other competitors. I am also of opinion that it would be better not previously to mention the position of doors, windows, fire-places, &c., until the successful plan is published, but leave these to the discretion of the architect, as this would be another test of his planning ability.

The method of roofing might easily be indicated by dotted coloured lines on one of the plans, the

successful competitor to be called upon for a perspective elevation after the competition is over.—I am, &c.,

Birmingham.

J. G. D.

SIR.—I was exceedingly glad to read the letter of your correspondent "H." last week. I had been, in fact, on the point of writing myself to suggest that any plan made entirely without reference to elevations would probably be more or less impracticable and Utopian. I do not suppose, indeed, that any one would or could plan a house without having some idea of his elevations. That being so, it would, I think, be only fair that competitors should be allowed to send in a sketch at least of the principal elevation, which would be of great use in explaining the plan.

As to "H.'s" suggestion about a limit of superficial area, I am inclined to agree with him that it would be desirable. Without something of the kind you would be flooded with such "Chateaux en Espagne" as can be built only a few times in a century. I fear we are all too apt to indulge in day-dreams of miraculously wealthy clients with no wills of their own, and it will doubtless be better to confine ourselves to a class of building which there is a reasonable chance that the fortunate among us may some day carry out.—I am, &c.,

J. B. F.

Llandaff, November 14, 1871.

SIR.—The suggestion of your correspondent "H.," in last week's issue, that the proposed plans should be accompanied by a perspective view, is in my opinion a good one. To arrange a plan, however ingeniously, without regard to external beauty and fitness, is a very different task to combining in a skilful manner interior comfort and convenience with an artistic treatment of the exterior. A perspective view, however slight, seems to me a necessity to convey any idea of the whole design. I would suggest, 1st. That each sheet should be prepared for reduction to one page of your paper. 2nd. That it should contain two clear and intelligible plans, with one perspective view. 3rd. That the drawings should be prepared for photo-lithography, and that those deemed most worthy should be published by you. 4th. That the style should be based on the true principles of Gothic art. 5. That the house be not absurdly big or extravagantly costly, the limit being, say, £8,000 to £10,000. As the planning of a house must always be largely influenced by special requirements, it would be well to define the particulars as clearly as possible, otherwise it would be difficult to compare the merits of the various designs. Iuoke, as it were, an imaginary client (the reality being rather shy) having certain general ideas on the subject.—I am &c.,

W. L.

SIR.—The correspondents who are at present urging you to offer a prize for the best example of house plans have, quite naturally, forgotten to tender any pecuniary assistance towards getting the result of their "hours of idleness" before the public.

A more important oversight remains, and that is the failure to perceive that the correspondence conclusively proves that the BUILDING NEWS meets the alleged want of specimens of house plans quite as fully as the majority of your readers can possibly desire. In a matter where so much depends on the requirements of the client, it seems unreasonable, if not presumptuous, to expect from such a competition the creation of a standard by which practical and theoretical architects may be guided in the future. A house planned without reference to the wants of a proprietor seems like "Hamlet" with the Prince of Denmark left out.—I am, &c.,

READER.

SIR.—In accordance with your last week's suggestion, allow me to submit that the mooted competition follow the recent "BUILDING NEWS Sketchbook Competition" as closely as possible. The requirements generally should certainly be set forth, and the cost defined, say £5,000, not more; calculated, for sake of securing unanimity, at 1s. per foot cube, contents being computed from level of ground-floor to ceiling of chamber-floor. Style and aspect should be fixed. Either two elevations, or at least a perspective view should accompany each plan, as a guarantee of its feasibility only, or as a feature in the competition if deemed desirable. I think the former. If within reasonable limits the whole of the designs should be produced, but in the event of an overflow in quantity or paucity in quality a wise discretion might be left in your hands.—I am, &c., F.

November 15th, 1871.

SIR,—In continuation of the above subject, I think if you were to limit the cost to £5,000 or £6,000 you would secure a larger number of plans in your proposed competition. Such a house is in far more frequent demand than one of twice or thrice the amount. In fact, it should be a residence suitable for a merchant or manufacturer, and not a mansion which is only now and then required. This is my view; and I would suggest that a plan of each floor be given, together with a geometrical elevation or two, all to $\frac{1}{4}$ in. scale. I would exclude perspectives, as there is little reliance to be placed on them, all sorts of dodges being resorted to for the sake of "effect." Besides, this is a competition for plans, not for drawing; at least so I take it. There will be comparatively little difficulty in deciding upon the merits of a design from the plans and elevations.—I am, &c., C.

SIR,—I am delighted to see in your journal the announcement of a forthcoming competition for house plans. This is a step in the right direction, which is more than can be said of most competitions. In accordance with your request, I beg to offer a few suggestions which I think would be conducive to the successful working of the proposal. 1st. That Professor Kerr or some other competent architect be requested to draw up the conditions of competition, and report upon the drawings when sent in. 2nd. That four or five plans, accompanied by reports, should appear in the BUILDING NEWS. 3rd. I would suggest that no views should be allowed; but this is a matter for the referee to decide.—I am, &c., COMPETITOR.

ARCHITECTS' OFFICE HOURS.

SIR,—As there is an effort being made to shorten the hours of daily labour throughout the country, will you permit me to offer a few suggestions as to the desirability of shortening the office-day for architects' clerks and pupils? I consider that from nine in the morning until four in the afternoon, with an interval of one hour for dinner, is quite long enough per day for any draughtsman to be employed; and feel convinced that this proposition would meet with the approval of most architects if they would consider impartially the many advantages their assistants and pupils would reap from the shortened office-day; think how much more time and inclination they would have for improvement in their profession; also think of the fact that architects as a rule have really only full office work about six months during the year, and their pupils are kept, for the rest of the time, at work on drawings, &c., which are really of no practical utility.

If our principal men connected with the Royal Institute of British Architects would endeavour to promote this scheme, and take the matter in hand, I am sure the assistants and pupils throughout the country would endeavour to employ the extra time they would have at their command for improvement and culture, which would act reciprocally to benefit the whole profession.—I am, &c., ASSISTANT.

Manchester, 14th November, 1871.

THE REBUILDING OF CHICAGO.

SIR,—Your correspondent "C. W. C." in last week's BUILDING NEWS, hints a suggestion, if practicable, of using concrete in rebuilding Chicago; and also questions with some surprise that our American friends have hitherto overlooked this composition. It is not often that we notice any dilatoriness on their part; and I ask—have they not already tried cement in building walls, &c., and found it wanting in stability against the severity of those more Northern seasons? I have no doubt that composition may be tempered accordingly; most certainly it will stand the test of the strongest frost that can occur in England, and I think with "C. W. C." that we should all feel interested to know the reason why our cousins have overlooked that economising material in building.—I am, &c., JOHN MELLIG.

STATUES, MEMORIALS, &c.

LEICESTER.—A memorial statue of Robert Hall has been uncovered at Leicester. Mr. John Birnie Philip was the artist. The statue, which is nine feet high, is of white Sicilian marble from the quarries at Carrara. The statue represents Robert Hall with head uncovered, and with a living expression of face, with right hand extended as if in the act of preaching. Over his left shoulder is thrown a cloak. The statue stands upon a pedestal of polished granite from the celebrated Penrhyn quarries of Messrs. Freeman.

THE FEVERSHAM MEMORIAL.—The memorial of the late Lord Feversham, which has been erected in Helmsley, was publicly unveiled on Friday. It consists of a Gothic canopy containing a statue of the deceased, and terminating in a cross. The structure is enriched with elaborate carving, is approached by a four-stepped base, and has a general resemblance on a small scale to the Scott monument at Edinburgh. It is fifty feet in height, and has been built from siliceous sandstone obtained from Bilsdale and Farudale quarries. The statue is of Sicilian marble, and represents the deceased nobleman in his robes as a peer, and as if in the act of delivering an address. It is from the chisel of Mr. Noble.

Intercommunication.

QUESTIONS.

[2376].—**Decay of Iron Railings.**—I have read with much interest the articles, "Theory of the Arts," which from time to time have appeared in your journal, and I should like to ask your correspondent "G. H. G." a question which bears upon the subject of "Ironwork" as mentioned this week. My attention is constantly attracted to area and other railings, not as a source of beauty, rather the reverse, but their durability—I should say their want of durability. The railings are let into a stone kerb, and run with lead, a course, I believe, generally adopted. This is all very well at the time, but in the course of a few years it will be seen that the iron is eaten away some two or three inches at the bottom until it becomes severed. Now, I should like to know the reason of this rotting, and if possible the remedy. Is it dampness that causes this decay? If so I do not see what is to prevent it.—H. W. P.



[2377].—**Cross-Staff-head.**—Will one of your surveyor correspondents inform me whether a cross-staff-head, similar to the annexed sketch, can be depended upon for taking horizontal angles; and how they are taken? Perhaps one of this kind would be useful in taking the bearings of streets, and in setting them out. I do not find this instrument in Heuther's book on Instruments, which is published by Weale.—J. H.

[2378].—**Boundary of Property.**—Will some experienced surveyor be kind enough to inform me what a "rod-full" is?—W. H.

[2379].—**Iron Wire Suspension Railways.**—I understand there are iron wire suspension railways at Kensington. Could any reader tell me who fitted them up, and where there are any in Scotland? Any other information regarding them would oblige.—N. B.

[2380].—**The Cymagraph.**—Will any reader kindly inform me where I can obtain the above instrument, and also its cost? I read that the Architectural Association in its excursion this year made frequent use of it, and I am anxious to do the same.—STUDENT.

[2381].—**Stains in Encaustic Tiles.**—Can any correspondent tell me what I can use to remove varnish from encaustic tiling?—K.

[2382].—**Proper Door Cases.**—I have seen it somewhere that a "proper" door case is those which have wooden cills, and are thus distinguished from other kinds. The term is not in use in Lancashire. Is it a Metropolitan technical term?—PERPLEXED.

[2383].—**"Building News" Plates.**—Could any of your readers inform me if the illustrations of the BUILDING NEWS since its commencement up to the present time could be purchased; if so, where, and the cost.—J. G., jun.

[2384].—**Hot-Water Pipes and Woodwork.**—Will any correspondent state (with proofs) whether woodwork in contact with hot-water pipes has ever or can be ignited by such contact?—W.

[2385].—**Colour.**—What is the best book on colour scientifically and artistically treated?—SPECTRUM.

REPLIES.

[2345].—**Door Frames.**—Wrought, rebated, beaded, and framed, whether fixed or not.—TERTON.

[2365].—**Roofing.**—There is a very good work "Iron Roofs of Recent Construction," with plates, at a moderate price in Weale's Series.—T. C.

[2366].—**Sewage Irrigation.**—There is no work on the subject. It is too recent; but there are several papers and pamphlets on the subject by Mr. Hope, Mr. Bailey Denton, Mr. Jacob, Mr. Cargill, and other engineers, which can be obtained at Messrs. Spon's, of Charing-cross.—T. C.



[2367].—**Sawing Timber.**—Take half the diagonal (i. e., $a b$), and with this "opening of the compasses" mark off all the angles as at $c d e f$, &c., and the thing is done correctly.—TERTON.

[2369].—**Girders.**—By "wall hold" of girders I presume your correspondent means the bearing, or the length of the girder that rests on the supports. A good practical rule is to commence with a minimum bearing of 1 ft. for a girder not more than 20 ft. in span, and add 6 in. for every increase in span of 20 ft. When large spans are reached this rule will of course require a little modification. With respect to the second part of the question of "Excelsior," I would remark that wrought iron girders of cellular construction are utterly obsolete. No engineer ever dreams now of employing such a method of construction. It would be wasting your valuable space to give the formulae required, but they can be found in Edwin Clark's work on the "Britannia Bridge," if "Excelsior" is determined to adhere to a style of girders that died out with the Menai bridge.—T. C.

[2372].—**Architect's Charges for Journeys.**—"A Young Beginner" is informed that in a case such as the one stated in the BUILDING NEWS of November 3,

In the absence of a contract upon which a charge by commission would be based or where no previous special agreement exists, the only course open to him is to charge for the time actually expended upon the work done. The rate of charge for time would depend upon the nature of the work performed. The lowest charge for time in ordinary cases which is sanctioned by the Institute of British Architects is three guineas per day; but where artistic talent in design is required the ordinary charge may be increased according to the nature of the case, and this exclusive of charges for travelling expenses and time occupied in travelling.—N. B.

[2372].—**Architects' Charges for Journeys.**—If "Vitruvius's" client is a reasonable man he will not make much dispute about the charge for journeys, provided all things are "up to the knocker." "Vitruvius" should be the best judge himself what he is really worth. If his job be but small, the usual five per cent. is really far too little to include journeys. My plan in such cases has been to charge what I fairly thought my services were worth, which has varied from three to ten per cent. I beg to call "Vitruvius's" attention to his famed namesake's opinion on the matter: "Moral philosophy will teach the architect to be above meanness in his dealings, . . . make him just, compliant, and faithful to his employer, . . . that he should not be occupied with the thoughts of filling his coffers, nor with the desire of grasping everything in the shape of gain," &c.—J. B. RUSTICUS.

[2374].—**Measurement of Brickwork.**—Measure as solid in both cases. Deduct fire-place openings in breasts for material only.—F.

[2374].—**Measuring Brickwork.**—Chimney breasts above roof are looked on in the North as "chimney tops." Having had a good deal of practice in measuring chimney tops, &c., my plan is to take the girth by the height for labour, and the flues at per yard or run, in accordance with the price below roof, which, if properly parged, varies from 9d. to 1s. per foot rise. Every measurer thinks that his plan is the "most approved," so that little can be set by that term; "custom of the country" has to guide one in many cases. Chimney breasts (below roof) are in many places (where not otherwise specified) taken as "measure and half," being the full girth and half across breast. The present system of measuring may be said to be one of the many things that really needs reform, as every county has its own particular system of measurement. In buildings particularly, we want one universal standard system of measurement laid down for our guidance, so that a practical man could be prepared to measure in any place. Why should "circular work" in many places be "measure and a half"? Or why should 18 in. in many places be allowed for eaves slate? Cannot the price be made suitable, and the real measure given? For materials, get the quantity and their price, &c.—J. B. RUSTICUS (Cumberland).

LEGAL INTELLIGENCE.

ACTION BY A MANX COMPANY.—The case of the "Glenaldin Slate and Slab Company, Limited, v. Samuel Trickett" was before the Court of Exchequer on Friday. This was an action heard at the Liverpool Assizes, and was brought by a company incorporated in the Isle of Man, to recover amount on calls from the defendant, who is a stone merchant at Manchester. The jury returned a verdict of non-suit, and a few days ago Mr. Kaye, Q.C., moved for a rule to enter the verdict for the plaintiff and set aside the non-suit. Mr. Hutton now applied to their lordships for a rule calling upon the defendant to show why an attachment should not issue against him for contempt of court, for neglecting to answer certain interrogatories respecting his being one of the seven original promoters of this company, which had been put to him by an order obtained from a judge at chambers. The Court granted a rule.

COLEGRAVE v. MILBURN.—In this case, brought on for hearing before Chief Baron Kelly at the July Assizes at Newcastle-upon-Tyne, and referred to arbitration, the arbitrator, Mr. F. J. Bramwell, C.E., has given the verdict in Mr. Colegrave's favour, with costs.

EPPING FOREST.—THE COMMISSIONERS OF SEWERS v. W. B. GLASSE AND OTHERS.—This case came on upon demurrer before the Master of the Rolls last week. The bill was filed by the plaintiffs on behalf of themselves and all other the owners and occupiers of lands and tenements lying within the Forest of Essex, otherwise Waltham or Epping Forest, except the defendants, and stated that the government of the forest was formerly administered by the Lord Warden of the forest, and other subordinate officers, and that the forest laws were executed by the forest courts, consisting of the Court of the Chief Justice in Eyre, the Swainmote Court, and the Court of Attachments, otherwise called the Forty-Day Court, of which last two courts four officers of the Forest, elected by the freeholders of the county, and called verderers, were the judges. The office of Lord Warden was abolished, and its powers were now vested in the Chief Commissioner of Woods and Forests. It was also stated that there had been but one verdict for many years, a writ, however, had been lately issued, and three persons were declared elected to fill up the number, though it was alleged that the election of two of them was informal and void. The bill also alleged that the owners of land and tenements

within the Forest, by virtue of ancient forest laws, made by the Crown, and confirmed by 6 *vers* statutes, enjoyed and still ought to enjoy¹ amongst other rights, rights of common of pasture over the waste lauds within the Forest, which rights were recognised by the Charta-forestae made by King John, and that by Henry III., and confirmed by a Parliament holden in the twenty-eighth year of Edward I. and also by a Parliament of the forty-second year of Edward III. Moreover, these rights had been enjoyed for time immemorial. The defendants, as lords and ladies of the manors within the Forest, claimed to be entitled to inclose the waste lands, and to dig up the pasture, turf, and other herbage thereon, and during several years past they had inclosed or sanctioned the inclosing of the numerous inclosures, the particulars of which were set forth in the bill. The plaintiffs further alleged that the Crown rights in the Forest were still subsisting, as were also the Forest laws, over the whole of the Forest, and they prayed a declaration that they (the plaintiffs) and other owners of land and tenements within the Forest were entitled in right of or as appendant or appurtenant to their several lands and tenements to a right of common or pasture upon all the waste grounds within the said Forest, for all manner of cattle commonable within the Forest, levant and couchant, upon their respective lands. An injunction to prevent the defendants from inclosing or building upon any of the waste lands, subject to the said rights, was also prayed. Mr. Joshua Williams, Q.C., Mr. Speed, and Mr. W. R. Fisher were heard in support of the bill on Monday, and on Tuesday Mr. Southgate, Q.C., replied on behalf of all the defendants demurring to the bill. His Lordship reserved judgment.

WATER SUPPLY AND SANITARY MATTERS.

BRADFORD SEWAGE WORKS.—The Bradford Town Council have accepted the tender of Mr. Archibald Neill, of Bradford, for the execution of the several works required for the defecation of the sewage of the borough. The amount of the tender for the works is £12,700, with £500 additional for stationary engines, cranes, &c., bringing the total to £13,200. It is stated that this amount is something over £3,000 in excess of the estimated cost as given by the representatives of the Peat Engineering and Sewage Filtration Company, who have entered into an agreement with the company to defecate the sewage of the borough.

BRIDPORT.—Engineers are at present engaged in making the necessary surveys, &c., preliminary to the construction of new water works, under the auspices, it is presumed, of a limited liability company.

DUNDEE.—For some weeks past the Dundee Water Commissioners have been at loggerheads with respect to the direct and indirect routes from Lintrathen, the source of the new supply, to Dundee. Mr. Bateman, who was the consulting engineer in reference to the undertaking, was in favour of the indirect route, and owing to his reply to some letter sent to him on the subject, his appointment to that office has been annulled by the Commissioners, who have resolved that Mr. Stewart and Mr. J. Leslie, of Edinburgh, should be engaged to make the necessary surveys and carry through the works.

SWANAGE.—There is at present much discussion among the residents of Swanage respecting the necessity and advantage of a thorough system of drainage, and we believe active steps will soon be taken to carry out this important object.

TAUNTON.—The Taunton Local Board of Health has been again occupied with the question of the disposal of the sewage of the town. Mr. Sutton, of the Exeter Sewage Company, who recently offered to purchase land, erect and carry on works for the disposal of the sewage, handing the affair over to the Board at the expiration of thirty years, has now sought a provisional agreement for three months to enable him to form a company with a capital of £8,000. The terms applied for are that the Board should grant him a lease of the works for twenty-five years, he paying the nominal rent of £5 per annum, and £7 per cent. per annum for the outlay, and undertaking to hand the whole premises over to the Board on the expiration of the lease, the Board for the present to pay the expense of bringing all the sewage to one point.

TROWBRIDGE.—A new system of main-drainage is about to be undertaken at Trowbridge, at a cost of £8,000. The Local Board have instructed Messrs. Gotto & Beesley to prepare the working plans preparatory to commencing the works. Outfall and irrigation works are left over for further consideration.

A new Church at Torfels, Weston-super-Mare, was opened on Wednesday week by the Bishop of the diocese. The building is of iron, with sittings for 380 persons. The roof and interior fittings are of deal, and the altar-rails, lectern, chairs, and communion table are of carved oak.

Our Office Table.

MANSARD ROOFS.—It is stated of the Chicago conflagration that the heavy Mansard Roofs invited fire and added materials to it. This, the *Chicago Tribune* hopes will check the passion for Mansards which has controlled the architectural mind of America for several years, and which has resulted in the most astounding medley of building abominations conceivable. In a certain class of very large edifices, with sufficient stretch to warrant them, these roofs, if proof against fire, are slightly; but when it comes to a Mansard for everything, from a church to a woodshed, the general effect is rather tedious.

THE NEW LAW COURTS.—The *Saturday Review*, in a trenchant article on metropolitan improvements, thus refers to the New Law Courts:—"As the public offices had given an example of the miscarriage of an unlimited competition, the limited competition for the Law Courts was so framed as to provoke the maximum of vexation. In this case also the knot was cut rather than untied by the appointment of Mr. Street; and no sooner was Mr. Street well at work upon that admirable site in Carey-street than a combination of economists, falsely so-called, and of men of art strangely beguiled, was all but successful in throwing everything into fresh confusion by the ill-judged scheme of running the building down to the Thames Embankment. With what face, after the ordeal of the Treasury and of the Office of Works, the buildings will ultimately appear, belongs to future history; but happily Mr. Street has a backbone."

COMPETITION FOR SCHEMES FOR THE REMOVAL OF SNOW.—At the meeting of the City Commissioners of Sewers, on Tuesday last, Mr. Deputy Farrar moved that it be an instruction to the Streets Committee forthwith to award the premiums of 30 guineas and 20 guineas respectively for the two schemes in their opinion best calculated to effect the removal and disposal of snow from the streets of the City, agreeably to the terms of their advertisement issued in November, 1867. He said that if the schemes were altogether worthless the Commissioners were bound to pay for the two best. They had no right as a public body to invite competition and then withhold payment of premiums on the ground that none of the schemes would answer. If they had that in view, they should have stated it in their advertisement. It was no answer to say that they had no fall of snow for two years after the schemes were sent in. Mr. Richards seconded the motion. Mr. Bedford said that when the snow did fall they found the schemes melancholy failures. The Chairman said the advertisement was for two schemes "best calculated to effect the removal and disposal of snow." None of the schemes effected that, so that none came within the terms of the advertisement. On the motion of Mr. Lowman Taylor the matter was referred to the Streets Committee, with an instruction to them to consider the propriety of paying the premiums, and to report thereon.

SOUTH LONDON TRAMWAYS EXTENSION.—In addition to the network of tramways on the Surrey side of the metropolis, and over which cars run for the conveyance of passengers from Clapham, Brixton, Camberwell, and Greenwich, to Westminster and Blackfriars-bridges, a new line of metals from Camberwell-green to Pimlico is now ready for use. It is a single line from Camberwell to Kennington junction. It passes along the Camberwell New-road, through Harleyford-street and the Oval, along Harleyford-road, and over Vauxhall-bridge to Pimlico. This cross route will afford great facilities for the public travelling from the south-west to the south and south-east of the metropolis, enabling passengers to travel between Pimlico, Vauxhall, Clapham, Brixton, and Camberwell, and (when the line is extended) to Peckham and Greenwich *via* Camberwell. The line from Pimlico to Camberwell will be opened next month. The difficulty experienced in the cars travelling round the curves at the Blackfriars-road Obelisk, and the frequent occurrence of the cars getting off the line, have been obviated by putting down movable points into the grooves.

THE END OF AN OLD HOUSE.—The *Edinburgh Courier* mentions that the house in High street Edinburgh, destroyed by fire on Saturday last, was at one time inhabited by the Abbot of Melrose, and was then known as Reseach House. Subsequently it became the town residence of the well-known lawyer and writer on heraldry, Sir George Mackenzie. It is said to be upwards of three hundred and fifty years old.

THE GREAT EASTERN RAILWAY EXTENSION TO THE CITY.—At the meeting of the City Commissioners of Sewers, on Tuesday last, the Finance and

Improvement Committee brought up a report stating that it was represented that the Great Eastern Railway Company proposed to carry their railway below the level of Sun-street, Bishopsgate, and to stop up the said street; and that the Committee, having heard the Remembrancer thereon, had instructed him and the solicitor to take such steps in Parliament or in the courts of equity or law as they might deem expedient to stay the proceedings of the railway company therein. The report was agreed to, as was also a further recommendation of the Committee that assent be given to a plan for passage way by the Great Eastern Railway between Broad-street-buildings and Sun-street, without prejudice to the question of stopping Sun-street.

STREET IMPROVEMENTS IN SHEFFIELD.—A new street is about to be constructed from the bottom of High-street to the New Midland Railway Station. We understand that the new street will be a continuation of Angel-street; that, commencing at the George Hotel, in the Market-place, it will pass through Wilson's works in a direct line to the station, and that it will be carried on to Suffolk-road corner. It will be 60ft. wide. It is hoped that the Midland Railway Company and the Duke of Norfolk will share equally with the Town Trust the cost of the improvement.

SURVEYORS TO LOCAL BOARDS AND PRIVATE PRACTICE.—At a meeting of the Holborn District Board of Works, held on Monday night, Mr. Walker, a member of the Board, moved that the Surveyor, Mr. Lewis H. Isaacs, be required to give his undivided attention to the performance of the duties of his office. It appears that when (sixteen years ago) the Board appointed Mr. Isaacs, his duties were defined, and he was required to devote the whole of his time to their performance. Subsequently, however, he was elected surveyor to the Hon. Society of Gray's Inn, and the Board passed a resolution rescinding the stipulation that he should be required to give his entire time to the duties of his office. The present salary given by the Board is £250. The feeling of the members of the Board was strongly in favour of Mr. Isaacs, the general opinion being that his duties as surveyor to the Board were most efficiently performed. Mr. Walker wished to withdraw his proposition, but the other members present refused to sanction its withdrawal, and it was negatived by the vote of the whole Board.

IS IT TRUE?—The *Doctor*, a monthly journal devoted to medical and sanitary science, draws attention to what is described as "a crying evil" in a quarter in which it has been too fondly held that philanthropy had achieved a satisfactory result. "It appears," says our authority, "that neither sickness, scarcity of employment, time, season, nor mishap of any kind is sufficient excuse to soften the hearts of those modern autocrats, the collectors and secretaries (save the mark!) of our 'Metropolitan Dwellings for the People.' The shareholders of the older section of those institutions pocket their percentages, and seem to care little as to the mode adopted occasionally to wring it from the impoverished and the wretched." The *Doctor* then goes on to show how unmercifully the "screw" is put, frequently by collectors, &c., on poor people living in model dwellings, who may be behind a little with their rent, or whose children may have laughed at the wrong time, and so on. "Surely," it continues, "the directors and shareholders should pay a little attention to the *personnel* of a fruitful source of their incomes. Is the philanthropy of Sir Sidney Waterlow, the Lady Burdett Coutts, Lord Shaftesbury, &c., as genuine as the screw applied to poor metropolitan dwellers of model houses? If so, why do they not correct crying abuses? Do parish sanitary inspectors feel satisfied with the internal state of the dwellings on account of awe-striking external appearances? If not, why do they not visit them? And lastly, is it true that collectors or secretaries of 'dwellings' direct money offices, sell house coals on commission, and expect to be patronised by those who dwell within their domain?" We echo the inquiry "Is it true?"

"AYRTON'S FOLLY" ABANDONED.—The proposal broached last year for burning an electro-magnetic light at the summit of the Victoria Tower, in order to convey to London by night the intelligence that the House was sitting, has been abandoned. The light was to have been of a very powerful description, and enclosed in a small glass globe upon the pinnacle of one of the turrets of the tower. Preparations were made for manipulating it by means of a battery driven by a three-horse power engine, but the preliminary arrangements threatened to be so expensive that Mr. Ayrton caused the whole scheme to be abandoned.

SKILLED LABOUR WANTED.—The building trades will be active in Chicago this winter. The *Chicago Tribune* says:—"Five to six hundred additional brick and stone masons can find employment in Chicago through the winter, at from 4 dols to 5 dols. per day. Two thousand carpenters can find employment all through the winter in this city at high wages. In March there will be employment for twice as many more of these trades. In addition, we want workers in iron and wood—and in every branch of labour. Many thousands of brick and stone buildings are to be erected, requiring an army of plumbers, gas fitters, workers in iron, tin, brass, and copper. In addition to these, thousands of labourers now starving in New York and other cities, can find work at good wages, with comfortable homes for themselves and families, on farms within 100 miles of Chicago.

MANCHESTER CORPORATION GASWORKS.—Last week the Gas Committee of the Manchester Corporation inspected the new gas-holders which have been constructed in Portland-street, Newtown, in connection with the Rochdale-road gasworks. There are two holders, one 155ft., and the other 96ft. in diameter, each having a depth of 32ft. In order to add to their capacity and economise space, they are three-lift instead of two-lift. The works have been carried out from plans by Messrs. Mangnall & Littlewood, of Norfolk-street, Manchester; the contractor for the ironwork was Mr. W. Nabon, of Hardwick; for the brickwork, Mr. E. J. Rutherford; and for the masonry Messrs. Ellis & Hinchcliffe. The cost of the ironwork has been £18,000; and brickwork, masonry, and excavating, £14,700; land, £2,200; joiners' work, £100; pipes and valves, £150; total £35,450. The two gas-holders will together hold 2,192,000 cubic feet of gas.

NEW HARBOUR WORKS, ABERDEEN.—The Aberdeen Harbour Commissioners recently paid a visit of inspection to the diversion of the Dee and the new south Breakwater. It was found that the contractor, Mr. Grainger, had succeeded in shutting out the water, and was emptying the new channel at the rate of 3,000 gallons per minute. He has excavated 860,000 cubic yards, and has only 90,000 to do. In nine days the water will be pumped out, and it is fully expected that the river will be occupying its new course within the stipulated time, which will not expire for two or three months. The breakwater is to be 1,200ft. long, 450ft. being already completed. This has taken 12,500 yards of concrete, upwards of 10,000ft. having been laid down in mass. 12,000 cubic feet of blocks are stored for building.

NEW HARBOUR WORKS, DUNDEE.—At a meeting of the Works Committee of the Dundee Harbour Trustees a few days ago, the offer of Messrs. A. & K. McDonald & Co., Glasgow, for the construction of a graving-dock 500 feet in length, opening both into Victoria and Campdown Docks, was accepted for the sum of £37,740, and for the completion of Victoria Dock, £44,240, making a total of £81,980. Messrs. Ower & Cunningham, the local engineers, estimated in December last that these works would cost £84,000. It is understood that the works are to be finished within two years.

THE FOURTH CITY OF LONDON MUTUAL BUILDING AND INVESTMENT SOCIETY.—The ninth annual meeting of the members of this society was held at the City Terminus Hotel, Cannon-street, on Wednesday evening. Mr. McCullagh Torrens, M.P., in the chair. The report stated that the amount received on investing shares during the year was £14,131 16s. 5d.; the repayments on advances amounted to £30,385; the amount received on deposit was £30,328, and the balance to the credit of the profit-and-loss account was £5,135, out of which the directors had resolved to pay interest, on all investing shares entitled, at the rate of 7 per cent. per annum. The amount received on investing shares was less than in the previous year, which was in consequence of the directors not having issued any new investing shares during the year. A comparative statement of the operations of the society showed that the rate of dividend, which was 6 per cent. the first year, had since ranged from 7 to 8 per cent. Mr. Deputy Walter moved a vote of thanks to Mr. Torrens for presiding; and Mr. Higham, in speaking to the motion, stated the members of all building societies owed a debt of gratitude to Mr. Torrens, for it was owing to him that the Friendly Societies Commission Bill, which passed the Lords almost in the last week of the session, was stopped in its progress in the Commons. That bill gave the Commissioners most inquisitorial powers, and invested them with the same powers as the judges of the land, and if it had not been for Mr. Torrens's energy it would have become law. Thanks were also voted to the directors and trustees.

CHIPS.

On Saturday, the 11th inst., the Bishop of Chester consecrated a new cemetery at Crewe.

New schools are to be erected at Liphook, Hants, Mr. Justice Erle, who lives there, having contributed handsomely towards their erection. Mr. G. Janson, of Greyshot, is the architect, and Mr. Rapley is the builder.

The church of S. Basil, Toller Fratrum-cum-Wynford Eagle, has been re-opened for service, after undergoing thorough repair and renovation, by Messrs. Guy & Son, Dorchester. A new open-timbered roof has been added.

Mr. Thomas Oliver, of Newcastle-upon-Tyne, has been appointed architect to the South Shields School Board.

The parish church of Tyringham, Bucks, which has been restored from the designs of Mr. Tarver, was reopened on Thursday week.

The final survey of the Scarborough and Whitby Railway is now being made, the land is being purchased, and in a short time the works will be commenced.

The Mayor of Hull has petitioned the Local Board in favour of a project for laying down and maintaining tramways in the borough.

The next meeting of the Institution of Surveyors will not be held on the 4th of December, as announced, but on the 11th December, in order that the many country members who will come up to see the Cattle Show may be able to attend the meeting.

The London, Chatham, and Dover Company contradicted the rumour as to the erection by them of a new market at Brixton, referred to in our last. Whatever may be done in this respect by others the company has no intention of initiating such a scheme.

An American paper gives the following as a cement for stoves:—Wood ashes and salt, equal proportion in bulk of each; reduce to a soft paste with cold water, and fill cracks when the range or stove is cool. The cement will soon become hard.

The new lighthouse which has been building for some time past on Blauheartach Rock, about fifteen miles west of the island of Colonsay, is now almost finished.

The whole of the space in the venerable parish church of Ottery S. Mary known as the north transept has been very neatly re-seated, and considerable additional accommodation thus afforded. The exterior, too, has undergone considerable improvements, and the pinnacles of the tower are to be replaced.

The next election of pensioners in connection with the Builders' Benevolent Institution will take place on Thursday, the 30th inst., at Willis's Rooms, S. James's.

The southern half of the new street from Holborn Circus to Ludgate-circus, referred to in our last, will be called St. Bride-street, the northern part only being designated St. Andrew's-street.

The schools of S. Michael's Parish, Blackburn, have been recently enlarged by an additional story, approached by a stone staircase, at a cost of £600. Mr. James Bertwistle, Blackburn, was the architect.

At a general meeting of the Royal Scottish Academy, held on Thursday week, Mr. John Pettie, A.R.A., and Mr. W. Q. Orchardson, A.R.A., were elected Honorary Members of the Academy; and Mr. John Smart, Mr. W. E. Lockhart, and Mr. W. Beattie Brown were elected Associates of that body.

Messrs. Nimmo & McKay, engineers, of Great George-street, Westminster, commenced to survey the projected extension line from Middleton-in-Teesdale to Alston last week. The length of the proposed line is twenty-two miles.

The contract for the ironwork and general engineering work required in connection with the new Greenock gas-works has been taken by Messrs. Hanna, Donald, & Wilson, of Paisley, at the sum of £36,000.

The new station at Rotherham, on the branch line from Sheffield of the Midland Railway Company, has been completed and opened for passenger traffic. Messrs. Chadwick & Co., of Masborough, were the contractors who erected the structure, which is of wood.

The Corporation of Bolton proposes to go to Parliament next session for power to acquire the undertakings of the South Lancashire Waterworks Company and the Bolton Gas Company. The Council will also solicit in the same Act an extension of the municipal borough to the outlying suburbs of Halliwell, Astley-bridge, Great Lever, and Rumworth.

A memorial window, by Wailes, of Newcastle, has just been completed at Chiddingfold Church, Surrey.

Mr. Angus Macpherson, of North Ormesby, Middlesborough, has been appointed as the new secretary of the Cleveland Institution of Engineers.

The Spanish cinnabar mine of Almaden is one of the last places where one would expect to find one of Boulton & Watt's original engines, but it appears that one was erected there in 1799, and has been at work ever since.

One good effect of the great railway amalgamation is already announced. The *Liverpool Mercury* says that a contract has been entered upon for a new and extensive station for Preston, and the work is to be commenced at once.

Two new courts have recently been completed at the South Kensington Museum. These courts will be used for displaying that magnificent piece of architecture and architectonic sculpture, the "Portico da Gloria," from the Cathedral of Santiago, and other large objects. The new courts are each about 120ft. long, 60ft. wide, and about 90ft. high. At the height of 60ft. from the floor is a gallery.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—*Royal Institute of British Architects.* "On the Revival of Gothic Architecture in Germany and France." By H. W. Brewer, Esq. 8 p.m.

TUESDAY.—*Institution of Civil Engineers.* (1) Renewed discussion upon Mr. Siemens's paper "On Pneumatic Dispatch Tubes," and then permitting, (2) "On the Stresses of Rigid Arches and other Curved Structures." By Mr. W. Bell, M. Inst. C. E. 8 p.m.

WEDNESDAY.—*Society of Arts.* "On the Present State of the Railway Communication to India." By Hyde Clarke, Esq. 8 p.m.

Architectural Association. Meeting of Elementary Class of Design. Subject: "A bay, or part of vaulted cloister, with entrance to Chapter House." Scale, 2ft. to lin.; date, 13th century. 8 p.m.

FRIDAY.—*Architectural Association.* Meeting of Class of Construction and Practice. Subject: "Physics." 6.30 p.m.

Architectural Association. Meeting of Class of Design. Subject: Cloisters to Cathedral, with detail of bay to half inch scale. 8 p.m.

Timber Trade Review.

PRICES, November 13.—Baltic fir timber, per load of 50 cubic feet: Riga, £3 5s. to £3 7s.; Dantzig and Memel crown, £4 to £4 10s.; best middling, £3 5s. to £3 15s.; good middling and second, £3 to £3 5s.; common middling, £2 10s. to £2 14s.; undersized, £2 10s. to £2 15s.; small, short, and irregular, £2 to £2 10s.; Stettin, £2 10s. to £2 15s.; Swedish, £2 7s. to £2 13s.; ditto small, £2 to £2 4s.; Swedish and Norway bulks, £1 18s. to £2 2s. 6d.; Memel crown oak, £5 10s. to £6 10s.; brack, £4 10s. to £5 5s.; Dantzig and Stettin crown, £5 to £6; brack and unsquared, £3 15s. to £4 15s.; Quebec red pine, mixed and building, £2 15s. to £3 5s.; Quebec large yellow pine, £4 5s. to £5 5s.; S. John's and board pine, £4 to £4 15s.; building sizes, £3 5s. to £3 15s.; pitch pine, £3 10s. to £4; Quebec oak, £6 to £6 5s.; Rock elm, £3 10s. to £3 15s.; ash, £4 to £4 15s.; large Quebec birch, £3 15s. to £5.

Deals, &c., per Petersburg standard hundred: Archangel, best yellow, £12 10s. to £14 10s.; ditto seconds, £9 10s. to £10; Petersburg yellow, £12 10s. to £15 5s.; Wyburg yellow, £9 15s. to £10; Quebec pine, first quality floated, £16 to £18; seconds, £12 to £13; thirds, £8 to £9; first quality bright, £18 10s. to £20; seconds, £13 10s. to £14 10s.; thirds, £8 15s. to £9 5s.; Quebec first spruce, £9 10s. to £11; seconds, £8 10s. to £8 15s.; thirds, £7 15s. to £8 5s.; S. John's first spruce, £8 10s. to £9; seconds, £8 to £8 5s.; thirds, £7 10s. to £7 15s.; unsorted, £8 to £8 5s.

Trade News.

WAGES MOVEMENT.

BROMSGROVE.—The wages dispute in the nail trade at Bromsgrove has been opened afresh, owing to a flagrant breach of faith on the part of some of the masters.

MIDDLESBOROUGH.—Yesterday (Thursday) week, a mass meeting of 800 or 900 engineers was held at the Oxford Music Hall, Middlesborough, to consider the question of overtime. Mr. J. Parkin, Chairman of the Nine Hours' League, presided. Mr. W. Charlton, the Secretary, moved "That in conceding the nine hours' system the innovation attempted to be introduced by the various firms—namely, work fifty-four hours per week before overtime counts, is deemed by this meeting worthy of resistance." The motion was carried without a single dissentient.

SALTBURN.—Mr. Kidd, joiner and builder, of Saltburn, has conceded the nine hours to his men, to commence at once.

SUNDERLAND.—On Monday night a crowded meeting of the Amalgamated Society of Joiners and Carpenters was held in the Golden Lion Hotel, Sunderland, to ascertain the feeling of the trade on the questions of the hours of labour and the present amount of wages. Mr. Thompson Laverick presided, and urged united action on the part of the trade, as he was certain that the masters, considering the flourishing state of trade, would concede the shortening of the hours of labour and an advance of wages. It was then moved, seconded, and agreed to, with only a few dissentients, that notice be given to the masters that, on the 26th instant, the hours of labour be reduced to fifty per week, and that the wages be raised from 28s. to 30s.; and that the masters be requested to appoint a deputation to meet the men. It was agreed to hold another meeting in a fortnight from the date of the meeting, to consider the reply of the masters.

THE BUILDING NEWS.

LONDON, FRIDAY, NOV. 24, 1871.

THE INFLAMMABILITY OF CITIES.

THE recent conflagration at Chicago has set the inhabitants of most great cities, in Europe not less than in America, thinking over their own possible dangers. The perils of towns in the two worlds are equal in degree, but different in kind. In the one they arise from combustibility and flimsiness of material hurriedly run up upon precisely the same principle as that we see at work creating, so to speak, a temporary timber camp for the burnt-out people at the head of Michigan Lake; in the other, from huddled masses of ancient buildings, in which every plank and beam is a piece of touchwood, and where a fire, once gaining ground, masters all around it. No doubt, where an adequate fire brigade exists, a countervailing power is established; but in how many countries of Europe is this the case? In London, it may be admitted, both the organisation and the machinery are admirable; yet the total of loss each week is enormous, or the insurance offices would be bursting with opulence. The warehouses, the private dwellings, the shops and factories destroyed find records for their fate in newspaper paragraphs; the indemnity is paid, the premises are restored, and the incident is utterly forgotten. Occasionally—as in the instance of the tremendous Tooley-street blaze, exceeding most others within living memory in point of duration and magnitude—a real impression is made on the public mind, but even then to very little practical purpose. The structure in which that originally broke forth, however inflammable its contents and floors, had solid walls; but suppose it had been situate amid the tanneries and rope-walks of Bermondsey, or the timber-yards of Pimlico, or the tottering framework fronts of Gray's-inn-lane. However, we will not at present enter in detail upon the question of our modern structural system as it affects the safety of the metropolis in this respect. It is well known that edifices which, by every conceivable application of iron, stone, brick, and concrete, the builders sought to render fireproof, have succumbed; but this is a separate part of the subject. After the Chicago disaster, and in a lesser degree, that of New York, some anxiety was naturally felt for London. How far may the capital of England be regarded as secure? The answer must be, to a lamentably slight extent, were it not for the vigilance, courage, and skill of that "red brigade," which is invariably on the march, or rather on the gallop, a very few minutes after the signal has been sounded. Our antique dangers consist in our over-packed streets, our dried-up roofs, floors, and staircases, our rotten wainscotings, and all the wooden appurtenances employed by our forefathers, which render a house as easy of ignition and as impossible to save as a lady's muslin dress. The newer perils are of our own wilful creation. The Act of Parliament declares that no manufacturing or warehousing premises within the metropolitan precincts shall cover an area greater than 216,000 cubic feet (equal to an edifice 60 feet square by 60 feet high), a few exemptions being allowed; but is the Act obeyed? So far from it that we could indicate buildings—and some not a great distance from St. Paul's Churchyard—which not only set the law at defiance, but set it at defiance with the most amazing temerity. Legislation, in this respect, has been a dead letter; and let us hope the penalty may not be paid by one of these mammoth London "stores," on the Chicago scale, being turned into a mountain of flame some Sunday night, through the dropping a light by a half-helpless watchman, of the class habitually employed to guard, from Saturday afternoon until Monday morning, millions' worth

of property. It must be a splendid rallying of engines to quench that furnace, whenever it is kindled. We are told of an hotel at Chicago—a wooden one—which, "if it once caught, would blaze like a funnel." Without saying as much of some among our City "improvements," we should congratulate ourselves upon not being in the ninth story if the snuff of a candle were to fall into a handful of paper or chips on the ground-floor. Indeed, a fireman has declared it as his conviction that, were a conflagration to break out here, under similar circumstances, no quarter of London—the City and docks especially—could resist it so well as did the great city of the Far West. And Captain Shaw asks whether we are always to rely on calm weather when a fire takes place—such still weather as saved Paris during the incendiaryisms of last May? A breeze, much less a gale, swaying to and fro, backwards and forwards, a pyramid of flame from among the chimney-pots of two or three old houses—say in the closer quarters of Finsbury—might drive the ruin before it like a forest fire. To little purpose would it encounter a roofing of slates, tiles, and metals, through which any great blaze can pierce as though it were paper, sure to find the materials of a bonfire below, in the shape of the wooden framework. The people of other European cities do, at least, profit by experience. Thus Hamburg, after her terrible calamities, found that it was not merely the drying of timber by summer heat which was perilous, but the freezing up of pipes by winter cold. Accordingly, it maintains a system by which immense supplies of boiling water are kept ready, night and day, in tanks like porter-brewers' vats, to thaw the frozen mains, which generally freeze hardest near the plugs. At the same time the Parisians, who had an escape so narrow during the late events, are going in another direction, infatuated beyond measure, and giving some of their streets pavements of wood, fixed with pitch, a fire ready laid whenever the match is applied. And that the match is rarely far from hand will be admitted if we remember the charge pending against an individual in London itself, of having fired the City in a hundred and twenty places, in order that he might raise the earliest alarm, and be rewarded for so doing. On the other hand, with modern appliances in reach, the giving up of an entire town to the flames is not so facile an undertaking as in former days. This is shown by the example of Paris, where the incendiaries had petroleum at command. The blaze that burnt the Tuileries was extinguished before it could touch the Louvre, and that which was designed to annihilate whole streets only created gaps. But that was in the newer and more solidly-constructed quarters. Had it burst out in the long, moth-eaten, ancient, half-wood, half-masonry streets of St. Antoine, or among the mouldering clusters heaped like the materials of a festal fire on the hills of Montmartre and Belleville, such a beacon might have been kindled as had not been seen since the days of Bartholomew, and we doubt whether all the *pompier*s of Paris could have done more than cool two mighty mounds of ashes. Paris is virtually fireproof in some parts, and an unlit torch in others. And so with Hamburg. Its fearful catastrophes have taught wisdom to the builders who build for the dwellers round the Alster-binnen; but they have had no lesson for the population which has its wealth really in charge, and which swarms in the wooden rookeries about the harbour.

Rarely anywhere, however, are lessons of the kind intelligently remembered. Thus with Moscow. It would be idle to moralise upon the conflagration which laid it in ruins by order of its governor when the First Napoleon was upon his fatal march, because any city determined to burn itself can do it; but again and again since entire quarters have been destroyed through the old historic folly of its architecture—shells of stone and domes

of easily-melted metal supported upon frames of Norwegian pine, erected in a raw state, of which it might almost be said that one half was wood and the other half resin. A single lick of flame and the whole structure would leap into combustion, carrying ruin inevitably to the right and to the left. Yet travellers are incessantly praising the Moscow and St. Petersburg fire brigade systems, and the water supplies of these cities—not more than they deserve undoubtedly; but the remarkable circumstance is that so much more stress is laid upon the facilities for extinguishing a conflagration than upon the means by which it might be prevented. It is like laying a train of gunpowder and watching for the moment when it may become time to flood the mine. This, however, is not the only affair of human life in which a similar principle prevails. But the truth is that timber is with the Russians of the far north, as with the Americans of the far west, so abundant and so cheap, so old-fashioned and so popular, so easily worked up and carved according to their peculiar tastes, while more enduring and less inflammable materials are so costly, that they calculate the risk against the cost, and reason that if a street can be consumed down in an hour it can be reconstructed, at comparatively slight cost, in a few weeks. We do not find this state of things in Vienna, which is among the richest cities of Europe. It is impossible to inspect its vast palaces, its commercial quarter, or even its working class suburbs, without being struck by the solidity of construction visible everywhere, except in those directions which actually bear the traces of conflagration—the sites of opera-houses, theatres, concert rooms, and casinos, buildings which in every capital of Europe have been the constant victims of fire—in London, in Paris, in Berlin, in St. Petersburg, in Moscow, in Munich, in Vienna, in Brussels, and in Leipsic, not to speak of our great provincial towns or the leading cities of the United States. At Leipsic it was decreed by the municipality, after a terrible disaster, that the theatre should, for the future, stand alone, and it stands alone accordingly, with the effects of its architecture a hundred-fold enhanced, and an exhaustless lake, ornamental and useful, close at hand. It is wonderful how many incendiaryisms of cities have originated in edifices of this kind. But in that very city of Leipsic, supposing a taper lit by accident in any house of the ancient quarter round the market, wherein some of the structures are so mighty that streets are literally carried beneath their ground floors, while each seems to have consumed a forest in its building, it is difficult to conceive how such a blaze could be quenched. The town seems actually made to burn, the timbers running through wall after wall, recklessly; and yet these are among the most venerable façades in Europe. In two other examples, widely distant, we observe the good effects of clearance and of substantial structure. In Brussels, though fires are frequent, they are generally confined to the lower or crowded town, though wood is not employed as a material, and seldom heard of in the stone-built, garden spaces of the Court quarter, or Cours de la Montagne; while in Munich, though a general calamity has not happened of late, the fire-engines are rarely summoned except to the multiplied Seven-dials of the plain over which King Ludwig rejoices to rule, though it must in fairness be said that his own palace is considerably less safe in point of continuity than his picture and sculpture galleries which, we believe, he has never visited, though reputed to be a Medici in his adoration of the arts. It is with no surprise that we perceive upon the fiery scroll which we have been at the pains to illuminate for a momentary purpose, the name of Constantinople visible very frequently and distinctly; but with much surprise we notice that the cities of Spain do not more prominently

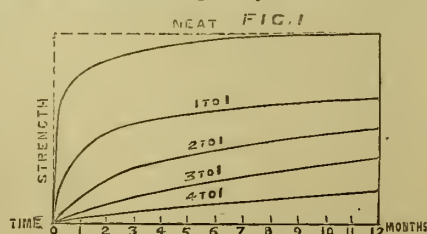
figure. The metropolis of "Asia in Europe" is largely made up of lath and plaster, of lattice-work and matting, of gauzes, wooden galleries, and all sorts of bonfire materials. Yet there is no little of this admixture in the more antique capitals of the Spanish provinces also. Still, they are generally massive and, as in the case of the great Italian cities, not often devastated by extensive conflagrations; their staircases, the main channels of fire in all buildings, are of stone or marble, as are the landings, the door and window frames, the bearing supports of the roofs—the use of iron for such purposes being either disdained or unknown—and often, as in Russia, even the doors themselves. If we hear of a ruinous fire anywhere in Spain, "ten to one" but that it is at a sea-port, where modern vices have been adopted, warehouses reared for space rather than security, wharves loaded with exposed combustible goods, factors allowed to puff among the merchandise with cigars in their mouths, and, in fact, all the elements of nineteenth-century civilisation and common-sense introduced. But, by way of parenthesis, a remarkable truth presents itself at this point. We have spoken of stone and marble doors. They were the acme of magnificence in the sight of the cultured ancients. Russia is the most barbarous country of our times professing to be civilised. Yet Russia is the only country of Europe which furnishes its palaces in this manner, and in this solid and sumptuous style of unvarnished and unveneered luxury. Her malachite gates shine with the polish of 1851, while the portals of Italy and Spain, from the whitest quarries of Carrara, are yellow with the tinges of the time when Leo built and Lopez wrote. For all that, they are better, as fireproofs, than the sandal and canary woods with which our transatlantic cousins are so fond of gewgawing their saloons. Striking a balance, we should say, notwithstanding the qualification with which we commenced, that the old, taken for all-in-all, is safer than the new, except in those quarters of great cities which, were it not for the sake of their miserable inhabitants, it would be a mercy to destroy, so that they might be rebuilt on a different plan. All humanity pities the people of Chicago, driven forth into hut and tent; but who cares one iota for Chicago itself, with its "big hotels," "big stores," "pig-killing machines," and "thousand miles an hour progress"? Still less would the world regret were some wildernesses of human dwellings which exist, ever ready in their age, and dryness, and decay, for conflagration, to be removed by some agency less terrific, to be superseded, not in London only, but in a hundred other cities of Europe, by suburbs in which the populations might live less troubled by this constant fear of cities.

NOTES ON BRICKWORK.—IV.

THE cements used in brickwork are chiefly two, Roman and Portland, but Roman cement is not much used for general works because of its setting too quickly; nor does it make so strong a joint. But its quick-setting property makes it very useful where water has access to the work soon after it has been laid, as in tide-work. It is made by grinding into powder the natural stones found in clay in the shape of nodules, chiefly at the Isle of Sheppy and at Harwich. A very good cement is also made at Hull, but on account of its containing a considerable quantity of iron in various forms and in various quantities, its colour is unequal.

Portland cement, on the contrary, is an artificial mixture of chalk and clay, the quantity of clay varying with the kind of chalk used: with the white, or upper chalk, from 20 to 25 per cent. of clay is used; with the gray, or lower chalk, from 16 to 20 per cent. of clay. These are ground up together in water and run into pits. The mixture is then dried, and afterwards calcined in a kiln with

very great heat; it is then ground in a mill and sifted for use. The fineness to which it is ground is one of the tests of its quality. The degree of heat to which the cement is exposed varies with the purpose to which it is intended to be applied. If a moderately quick-setting cement is desired, it is comparatively lightly burnt, and will not weigh so heavy as another kind that may be required in situations where quick setting is not of the first importance, but where greater strength is the point aimed at—greater tenacity; in that case the cement is submitted to a greater heat, and will weigh heavier than the other sort, but it will take a longer time to set. To grind this sort into a fine powder is difficult when it has been highly heated, but when fine grinding has been accomplished, this quality of weight forms another test for strong cement. But it is necessary that the weight be produced by a high degree of heat, and not by a too great proportion of lime. If the cement be robbed of its due proportion of clay for the purpose of increasing its weight it will be robbed of one of its essential qualities as a cement. A cement may be made to set quickly merely by underburning it, but it will give again. A very good cement, without excessive strength, weighs 110 lbs. to the bushel, and is finely ground. Very heavy and exceedingly strong cement—if also finely ground—weighs 120 lbs. to the bushel. Unlike fat limes, which cannot be used without a good deal of sand, Portland cement is strongest when used neat. With 1 of sand to 1 of cement it ultimately becomes about $\frac{2}{3}$ of the strength of neat cement. With 2 of sand to 1 of cement, about $\frac{1}{2}$; with 3 to 1, $\frac{1}{3}$; with 4 of sand to 1 of cement it ultimately becomes about $\frac{1}{4}$ of the strength of neat cement. The greater the proportion of sand the longer time the same cement takes to set. For instance, from the experiments made during the construction of the metropolitan main drainage, on the south side of the river, neat cement attained in about a fortnight half its ultimate strength, which was attained in about two years. When the cement and sand were mixed in the proportion of 1 of cement to 1 of sand, the ultimate strength was about $\frac{2}{3}$ of that of neat cement, but the strength in the meantime was not nearly in this ratio. With 1 of sand to 1 of cement the strength in a fortnight was only two-fifths of the strength of neat cement in the same time. With 2 of sand to 1 of cement, only $\frac{1}{2}$; and with 3 of sand to 1 of cement, only one-eighth. But as time goes on it will be seen that the sanded cement gains in comparative strength, for in a month the mixture of 1 to 1 was $\frac{1}{2}$ as strong as neat cement in the same time, as against two-fifths in a fortnight; with a mixture of 2 of sand to 1 of cement it was $\frac{1}{3}$ as against $\frac{1}{2}$ at a fortnight; and with 3 to 1 it was one-twelfth, as against one-eighth. Again, at the end of three months, the mixture of 1 to 1 was $\frac{2}{3}$ of the strength of neat cement in the same time, as against $\frac{1}{2}$ at one month; with 2 to 1 it was $\frac{1}{2}$ (nearly) as against $\frac{1}{3}$ at one month; and with 3 to 1 it was one-seventh as against one-twelfth. So that where sufficient time can be allowed for the hardening, it is economical to increase the proportion of sand, but when the cement must set quickly it must be used neat. The following diagram exhibits the comparative strengths at the end of each month during one year:—



It is, therefore, in some sense, a matter of judgment what proportion of sand shall be

used. There is one thing to be said about a large quantity of sand, however. Unless the sand and lime, or sand and cement, are most thoroughly mixed—unless, in fact, every particle of lime is endowed with its proper proportion of sand, and each portion of sand with its particle of lime—no good mortar can be made. Smeaton found that although sand did not weaken the mortar when thoroughly mixed with the lime, yet that practically, when more than 2 of sand to 1 of lime were directed to be used, the trouble and time required in thoroughly mixing them exceeded the cost of extra lime. However, whenever so large a proportion of sand as 3 to 1 of lime is directed to be used, there is no doubt about the necessity for extreme care in performing this very important part of brickwork—mixing the mortar.

Another thing that is most important is that the smaller the quantity of water used in making up the mortar or cement the stronger—not merely the stiffer—will either be, and one reason is that with sloppy mortar, where there is much sand, it settles by its gravity to the bottom and leaves the lime by itself at the top, thus undoing whatever may have been well done in mixing it. Each kind of lime takes its own quantity of water to reduce it to a proper consistency, and therefore general rules of proportion would be valueless for any particular kind of lime, and the quantity of water must in practice be left to the judgment and skill of the workman; but in general it may be said that a common, or fat, lime requires about 6 gallons to slake each bushel of quicklime, and another 6 gallons to mix the mortar it produces; that the lia lime requires about 2½ gallons to slake each bushel, and about 4½ gallons to mix the mortar it produces; and that if the blue lia be ground it requires about 5 gallons to mix the mortar. Also that Portland cement gauged in the proportion of 1 of cement to 1 of sand requires about 3 gallons of water per bushel of cement; if gauged at 2 to 1, about 5 gallons; and at 3 to 1, about 6 gallons. But, whatever quantity may be required for particular sorts, this is always true: that stiff mortar or cement is better than that which has been mixed with too much water. The bricklayer needs only to see that the bricks are soaked with water before they come to him in order to use stiff mortar as freely as sloppy mortar and dry bricks.

All hydraulic limes and cements must be made up in small quantities and used fresh, and after the sand and lime, or sand and cement, have been thoroughly incorporated in a dry state, the best way of adding the water is through a rose on the spout of a common watering can; sprinkling, rather than flooding the heap with water.

If Portland cement is kept in a dry shed it improves rather than otherwise by being exposed to the air, especially if it is occasionally turned over, for those particles that may have escaped the grinding of the rollers will then fall to a fine powder; but if a damp atmosphere have access to cement before it is made up it will assuredly be spoilt.

A new kind of mortar has been invented by Colonel Scott, R.E., called selenitic mortar, an account of which appeared in the BUILDING NEWS of July 7 last. It appears to be new in this respect, that the lime is prevented from slaking by mixing with it sulphuric acid, derived from plaster of Paris, gypsum, or green vitriol, enabling it to carry much more sand than slaked lime will. The proportions given for mortar for brickwork are; 4 lbs. of plaster of Paris mixed in half a pail of water; put this into the mortar pan in which the edge-stones run, and add 2 or 3 pails of water, 1 bushel of lime, and 6 bushels of sand.

Selenite is crystalline sulphate of lime, or gypsum. Gypsum contains, according to Page's "Handbook of Geological Terms," 46.47 per cent. of sulphuric acid, 32.65 per cent. of lime, and 20.88 per cent. of water. By calcining this mineral and grinding it down to a

white powder, plaster of Paris is produced, which forms a paste that soon hardens, by absorbing the water driven off by the heat. No doubt the use of this mortar, and its effects, will be closely watched.

THE RICHMOND COMPETITION SEWAGE PLANS.

THE Sewage Committee of Richmond have just made a notable move towards meeting their sewage difficulty, by awarding 100 guineas premium for a plan which it is supposed will relieve them of it. The difficulty arises from the action of the Conservators of the river Thames in procuring Acts of Parliament to prevent the pollution of the river with the sewage of the towns in the Thames valley from one end to the other.

Above the area of the metropolitan district, which terminates at Putney, all the towns in the valley have made an increasing use of the river year after year as the outlet of their sewage. Five of the London water companies take their supply direct from the river—viz., the Chelsea Company and the Lambeth Company at Ditton, a short distance above Kingston (but these are now proposing to extend their intake upwards to a point above Hampton lock). The Grand Junction Company, the Southwark and Vauxhall Company, and the West Middlesex Company take their supply from the river at Hampton; and a sixth company, the East London, are constructing works in the same neighbourhood. Each of these companies pays a large yearly sum of money to the Thames Conservators for the privilege of taking water from the river, and one of the conditions of payment is that the Conservators shall use their utmost endeavour to prevent the pollution of the water with town sewage. The authorities of Reading have already procured powers to take land for the purpose of utilising their sewage by irrigation. At Oxford they are following a similar course. At Eton land is already being irrigated with the sewage. Kingston has made a hard fight to get land for the same purpose, but, after a five days' inquiry by a Government officer, at which six barristers assisted, four of whom were opposed to the scheme, the influence brought to bear against the corporation was too great for the success of their scheme, and they are now turning their attention to land in another direction.

It is always the difficulty of procuring land that stands in the way of the utilisation of town sewage by irrigation. The town authorities are willing to purchase, but the landowners refuse to sell. The ratio that the area of land should bear to a given population is variously estimated, and, indeed, depends to some extent on the nature of the land, the more usual estimate being one acre to each hundred persons; but the sewage of only fifty persons per acre can be applied profitably to the farmer, while, under stress of circumstances, an acre can be made to use the sewage due to 150 persons, but with smaller profit to the farmer. But to make it possible to apply sewage at all profitably the land must be purchased at its agricultural value; whereas no sooner is land proposed to be taken by a town authority for this purpose than a fictitious value is set upon it, and either by the excuse that it is valuable as building land, or that it is too near residential property, or that it is unsuitable, the landowner and his friends have usually stood very much in the way, and greatly increased the difficulty of dealing with town sewage.

In August last the Richmond Sewage Committee offered a premium of one hundred guineas for "the best practicable plan for disposing of the sewage of the parish, so as to comply with the requirements of the Thames Navigation Act, 1866, and the Thames Conservancy Act, 1867." The

present population of the parish is 15,110, and is rapidly increasing. The number of houses is 2,885, and the rateable value of the parish is £100,000. The 14th of October was appointed for receiving the plans and reports, and in answer to the advertisement numerous sets of plans, with reports, have been sent in. On Wednesday last the Sewage Committee awarded the premium to the authors of the plan marked C. E. (understood to be Messrs. Gotto & Beesley).

The successful competitors state that the system they recommend has had their attention for twenty years, and that it has been for the last seven years, and is still, in continuous and successful working at Rio de Janeiro, where the population is 400,000. The sewage, by this process, is disinfected and deodorised by being completely amalgamated with sulphate of alumina, charcoal, and other chemical agents, in closed vessels, whence it passes, by suitable waterways, into long precipitating tanks, where the solid matter is separated, and the top-water (first being strained) is passed through charcoal filters, and is said to be clear and free from smell. The precipitating tanks are to be provided with the means of drying and removing the deposit prepared for agricultural purposes. In addition to this solid manure, the effluent water, though said to be clear and inoffensive, contains fertilising salts in solution, which, the authors think, may be profitably employed in irrigating the market gardens in the neighbourhood. So long ago as the year 1854, Professor Way reported to Lord Palmerston on the effluent water of this process that "when the operation is properly conducted the liquid is bright and colourless; it has no smell, and is otherwise inoffensive; it contains very little animal or vegetable matter, and although it would be too much to say that it is fit for domestic purposes, it might with perfect safety be thrown into rivers and water-courses of large size." This report was founded on experiments made at Scotland-yard, and is said to have been fully borne out by the larger experience of many years at Rio, where, it is said, the successful results have at last dissipated all doubts on this hitherto difficult subject. The situation of the largest deodorising establishment at Rio, dealing with the sewage of 150,000 people, is in the principal commercial street, and is said to be carried on without inconvenience.

In applying the system to Richmond, the authors propose to erect deodorising works at the corner of Water-lane, on the site of the old brewery, or on the vacant land adjoining the South-Western railway-bridge, near the outfall of the present main sewer. Both these sites being near the river side, either of them, it is said, will be convenient for the transport of coals, chemicals, and sewage manure, as well as being, in point of level, advantageous for the concentration of the sewage.

A great part of Richmond lies above the level of the proposed tanks, and the sewage of this part is proposed to be brought into them by gravitation, while the sewage of the lower district will be pumped into them. The high level sewer is proposed to be 3ft. 9in. high and 2ft. 6in. wide, commencing at the deodorising works and traversing Water-lane, George-street, and Marsh Gate-road, if the first-mentioned site be adopted, or if the alternative site near the railway-bridge be adopted, the sewer could be constructed across Richmond-green instead of George-street. The area drained by this high level sewer would comprise about half the town.

For the lower district the authors of this plan propose to lay a cast iron pipe, 2ft. diameter along the river bank, so as to collect the sewage issuing at the several points along the river side, and conduct it to the pumping station. A cast iron pipe is preferred for this purpose to a brick sewer, in order to prevent leakage of river water or landsprings

into it. It is calculated by the authors that these sewers will be sufficient for double the present population, the average rate of flow of the sewage being estimated at five cubic feet per day per head of the population, one half the daily flow being assumed to run off in six hours; and in addition to the sewage provision is made for dealing with the rainfall to the extent of a quarter of an inch in depth over the whole area of the town in twenty-four hours, both the rate of sewage flow and rainfall being the same as were calculated upon in designing the metropolitan main drainage. As in these latter works, also, storm outlets are provided to carry the excess of rainfall and sewage direct to the river, it being assumed that when these heavy rains may occur the sewage that may be mixed with the storm water will be in such a state of dilution as to be almost inappreciable.

For the purpose of pumping the sewage of the lower district into the tanks, and for working the mixing apparatus, it is proposed to erect a fifteen horse-power steam engine in duplicate, which is expected to allow a good margin of power for the requirements of the prospective population.

The authors estimate the cost of the deodorising establishment, with duplicate engines, boilers, and machinery, at £7,000, exclusive of land; and the cost of the high and low level sewers, including side entrances, ventilators, and the connection of the existing sewers with the new mains, at £5,900, making a total of £12,900.

The annual expenses are estimated as follows:—

Superintendence (would be performed by the Town Surveyor)	nil.
Wages	£350
Coals	198
Chemicals	700
Wear and tear	100
Total	£1,348

Expected returns—1,460 tons sewage manure, at from £2 to £3 per ton, say £2

Profit per annum

This would pay off the principal and interest in thirty years, and still leave a margin of profit of £500 or £600 a year, and this is without taking into consideration any return from the use of the effluent water, which, unless turned to profitable account by irrigation, will flow into the river.

We hope the plan will answer all expectations, and so far as the interests of Richmond are concerned it may be considered that they are safe in the hands of the Sewage Committee, and that the Committee are satisfied that the plan is the best that has been laid before them; but it seems a little curious that the only evidence put forward on the merits of the process which the Committee have chosen to adopt is a report made on some experiments so far back as the year 1854, seeing that since that date so many reports by chemists equally eminent with Professor Way have been made on other processes, and in terms much stronger than those applied by Professor Way to this process—processes, we mean, very much resembling this one in character; for instance, Dr. Bird's (Stroud), the A B C, the Phosphate process, and others.

We suppose the experiments mentioned in Messrs. Gotto & Beesley's report as having been conducted at Scotland-yard, and upon which Professor Way reported to Lord Palmerston in 1854, are the same as those upon which the late Mr. Henry Austin, the then Chief Superintending Inspector of the Board of Health, reported to that Board in 1857, that the ingredients cost 30s. per ton, and that one ton of ingredients made two tons of manure.

DILAPIDATIONS.—IV.

LAY.

WHO that has a large practice has not been often surprised at the dicta as to what are dilapidations!

In my own experience I remember a few startling requirements. On one occasion, at the determination of a lease, a claim was made to take up and inspect all the drainage, cleansing same if requisite, although there was not the slightest indication of anything being the matter with it; and notwithstanding that everything appeared perfect, it was contended the lessor could insist, at the expense of the lessee, that all the works should be laid bare and made good thereafter, and even if found perfect, that would make no difference in the question as to the cost falling on the lessee! A similar requirement as to chimneys, I may mention, *obtains*, or is at least demanded, on the London estates of a noble duke, and at the end of term a sum of money is asked to cover the cost of sweeping all the chimneys, although it can be shown they have been swept within a reasonable time; still the claim is insisted on. This is a very small item, but serves to illustrate what wrong ideas are in vogue as to what is a dilapidation. Another instance, where the treads of a staircase were so worn that new nosings were required, it was insisted that new nosings would not satisfy the liability, but that new treads must be provided. Again, on another occasion, where the treads were slightly worn only (this case refers to weekly houses, where carpets are the exception), the lessor's surveyor tried to maintain that he was entitled to have new treads. Next, as to walls being slightly out of the upright. I had to refer the matter to an umpire in one case, even though it was admitted by my co-arbitrator there had been no neglect of the fabric, and that consequently the slight bulge of the side wall (which was of great length and height, and formed the wall of the return street) was not caused by any neglect on the part of the lessee; still I was required to pay a sum to cover the pulling down and rebuilding. I resisted, and the result, of course, was in my favour. Speaking of walls, I am reminded of another requirement often insisted on—namely, to “rake out and repoint brickwork off front and back walls,” notwithstanding that there may not be any open joints, and the work may be quite sound; and sometimes I have been told, “Well, but the brickwork has not been pointed for some time, and looks dingy;” a reply which aptly showed how totally unacquainted the speaker was with the rudiments of the laws of dilapidations. Again, when you are trying to make a money settlement is it not sometimes advanced, “Well, but my client must spend a great deal more than that before the house will be fit to let?” as though dilapidations were synonymous with putting premises in good order, fit for a new tenant. With regard to marble chimney pieces of an expensive character, a claim has been unsuccessfully made for the value of a new one, where the existing one was damaged only at the edges or chipped. Yet again, I remember a case in which the particulars of the dilapidations were delivered in an action, and contained the following reference to the fastenings of doors:—“These bolts are quite ineffectual to secure the doors. If fastened they could be easily forced open, and being high up they are not easily used;” and in another part in reference to other fastenings which were out of reach of “any person of ordinary height, being 6ft. 9in. from the floor.” See how wrong the description, even assuming the surveyor right. Clearly the height of a bolt from the floor could be no dilapidation unless it could be shown that the bolt was found in a different position to that in which it was originally placed at the granting of the lease. Now, to continue the assumption of accuracy on the part of the surveyor who

took the items referred to, his language should have been *reinstate the bolt in former position*; or words to that effect; for it is monstrous to assume that if in an original construction a builder put a bolt where it cannot be easily used that such can be a dilapidation. It CANNOT; while it would be a dilapidation to remove a bolt from its old position. Of course such points are very trivial, and the majority of surveyors would have great contempt for those who use such trivialities to swell their particulars of dilapidations; still I must remind them that a lengthy document does influence lay judges and juries, for I recollect once hearing a jurymen say, “Well, if it takes all that quantity of paper to explain the breaches, there *can't* (sic) be no (sic) question, there's no defence”; and I never shall forget the laboured efforts of counsel to explain that though of such a length, many of the items were not dilapidations at all, and others were really most minute repairs. No doubt most of my readers can recall similar instances, where in resisting unjust proceedings, they have been met by most minute and at the same time most technically accurate schedules. Where, for example, small scratches on painted back doors (by a dog possibly) are entered, “touch up the damaged paintwork of back door, top grain and revarnish,” a rather formidable paragraph, because a pet dog was kept longer out than he liked. Among my very early recollections, is one firmly fixed in my memory of a dispute between two surveyors, one certainly well-known and respected, when an item in the schedule of dilapidations in respect to the drawing-room was “provide and lay a new front marble hearth in lieu of present broken one.” Well, I confess I could not see the defect with my pupil eyes (no pun intended, I assure you), but it was in those now far-off, never-at-the-time appreciated days when I was in my pupillage; and yet I am sometimes tempted to be angry at people always speaking in adulation of things and days past, because no doubt all past times and events are only good and pleasant because we *now* understand them, as some ten years hence we shall understand the events of *to-day*, while to-day we are fretting and fuming and believing all human nature unappreciative and selfish—then (ten years hence), when old age creeps on us, perchance we shall talk of the pleasures of ten years since; of the delight of conquering difficulties; of having no weak sight, no incapacitated limbs to hinder us in the great fight of progress; no worrying complaint (chronic, no doubt) which always checks us when we are most anxious to do good work. But I must not digress; I only thought that such reminiscences as these make us more contented, and such as lead to this result are much needed in this day. Well, to continue this early experience, even the surveyor who had to support his claim could not at first find the flaw, but pointed out a vein in the marble. This being shown to him not to be a crack, on a second examination he discovered the crack, when the other surveyor replied, “Do you insist on that? You must have taken the dilapidations with a magnifying-glass.” The result may be imagined: a reference to an umpire. One last case I would mention. There is usually the covenant to paint at a fixed period. Well, will it be believed in an arbitration a surveyor stated that year by year the liability accrued? Thus, suppose the covenant be “paint once in seven years,” that at the end of the first year after the painting had been well and properly done, *one-seventh of the cost of the painting of the entire house has become due*, and was a dilapidation, and when pressed by counsel with the proper question, “How, sir, then, can this dilapidation be avoided?” he replied he d'd not know, but still held that it was an accruing dilapidation. So peculiar a dilapidation necessarily astonished the skilled witnesses present, and we all listened eagerly to the reply to the next question, “Would, in your opinion, then, the dilapidation be met

by painting properly one-seventh of the house each year?” While the witness seemed at a loss for a reply, and somewhat, I think, or at least hope, awakening to the absurdity of his proposition, the umpire decided the question was unnecessary, “as it clearly meant that the entire house should be painted once in seven years,” and he therefore held “it would not satisfy the covenant to paint parts at different times, but the house must be painted throughout once in the time stated in the lease.” Therefore we lost the explanation we longed for. It still remains a mystery how any one could conceive the idea that a liability which only arose at a fixed period could be divided, so as to arise a portion yearly, *without* the person responsible having the slightest power of satisfying it, or preventing his being deprived of the property. I might continue *ad infinitum*, but surely I have given enough instances, without multiplying them, to show how often we have to meet those gentlemen whose ideas of dilapidation and waste are, shall we say, *peculiar* (though the foregoing observations, while they illustrate the want of information on the subject, should also be read as useful hints of those false claims which are to be avoided). I believe we can remedy this by making these pages the means of circulating far and wide, in a concise form, an explanation of what really dilapidations are. We shall thus make more certain the opinions as to what they consist of, and confirm the proper and fixed fundamental principles to guide the profession in their decision. That such is not the case at present, if these few remarks are not sufficient to prove, I will cite a case where an old friend of mine (a well-known surveyor), had (as trustee) a number of cottages, the lease of which expired, when a claim was made for between six and seven hundred pounds for dilapidations. In alarm he went to survey the premises, and carefully made his estimate, amounting to less than one hundred pounds. There being no chance of settlement, an action followed, and the matter was referred in court to one of our leading surveyors, whose award amounted to within £20 of my friend's estimate. Imagine, reader, the difference! Why, builders' variations in tendering are most limited compared to this. Where have you seen one tender seven times larger than the lowest? And yet the builder should be much more liable to err than the surveyor. The builder does not know the architect; is afraid he may not get from this particular architect his certificates fairly; thinks the drawings are more elaborate in the hurry of tendering than they are (perhaps because they are more fully shown by detail drawings than he is accustomed to); has, perhaps, plenty of work to do, and therefore all his plant employed, and will have to hire plant for the job should his tender be accepted; will have to employ a new foreman, with the chance that he may not be so energetic as he ought to be. Now the competing builder whose tender is lowest may have these points in his favour, and they may somewhat explain the difference between his tender and the others. He knows his architect to be a just while painstaking man; that he shows every minutiae in his drawings, is prolix (or *very full* is a prettier way of expressing it) in his specification, and that he has a great objection to any builder losing money by his contract through the slightest chance of misunderstanding all the details he requires executed. All honour to such a man! though I have only sketched the characteristics of, I firmly believe, the great majority of my profession. Well, can you wonder, although you see sometimes the tenders published in our journals with as many as three or four notes of exclamation after the lowest tender—can you wonder, I say, at the large differences which have so many and such varied causes to produce them? But where there can be no reason for difference—where none of the causes exist which

much explain the great differences in the tenders of builders, how are we to explain the enormous differences that are daily thrust before our notice in the value of dilapidations and waste? I conceive we can only do so on the assumption I have already advanced, which is, that there is an utter want of realisation in the minds of surveyors of the fundamental bases which must guide all decisions as to what are dilapidations, and how the *quantum* is to be arrived at. If I were to ask the question "Define what are dilapidations?" many would reply: "Of course I know—ha, ha, of course—ha, ha, dilapidations are dilapidations—waste, you know—that sort of thing." Pray understand I am not in the least speaking disparagingly of our profession; but as I have before remarked, we have such varied work to do—to-day a prison; next a mansion in the country, with all its difficulties of drainage and water supply, and that, with half the money to expend, it must be more striking and showy than Lord So-and-so's; next schools, money again limited, subscriptions not coming in so freely as expected, and our plans must be so made as to pass the stringent requirements of the great authorities. Next, perhaps, designs in competition for baths and wash-houses are required. Then a public-house, which must have excessive show at limited cost. Then a survey for buying and afterwards laying out land for building purposes. Then, perhaps, an elaborate design for a reded. But why continue? I only desire to show that the extended and varied requirements of our profession will certainly excuse any slight want of knowledge in its professor, unless they devote themselves with painful earnestness to conquer.

But I must keep close to my subject, and first let me give the definitions of Dilapidations, then of the different kinds of Waste.

First, then, I think Bacon's definition good. It is "the committing of any spoil or destruction in houses, land, &c., by tenants, to the damage of the heir, or of him in reversion or remainder."

Next, the best legal definition, I find in Grady's work, and is as follows:—"Dilapidations or waste may be defined to be the act or default of the party having a usufructuary interest in the lands or tenements of another, by which the property of that other is injured or deteriorated."

Good as the above definition is, I confess I prefer, for our practical guidance, that given by our Institute of Architects in their report. They say "they are of opinion that dilapidations are, in usual practice, considered to be those defects which have arisen from neglect or misuse, and not to extend to such as only indicate age, so long as the efficiency of the past still remains. But if the effects of use or age have proceeded so far as to destroy the past, or its efficiency in the structure, this argues neglect or misuse; it being the presumption that at the commencement of his term the tenant was satisfied that every part was sufficiently strong to last to its close."

The full meaning of this term is so important I am tempted, however, to give the definition of that old authority David Gibbons, who in his work, "A Treatise on the Law of Dilapidation and Nuisances," 2nd edition, 1849, thus describes it:—"Dilapidations, or rather waste, may be defined as the act or default of one party having a right to use a tenement to the injury of another having a right to the same tenement."

Let us next take the definition of WASTE. Probably Webster's dictionary gives a more easily understood meaning than the writers on the subject. "In Law, spoil, destruction, or injury done to houses, woods, fences, lands, &c., by a tenant for life or for years, to the prejudice of the heir, or of him in reversion or remainder."

In les term des la Ley, tit. "Waste," it is said, "Waste is, when tenant for term of years, tenant for life, tenant for term of

another's life, tenant in dower, tenant by the courtesy, or guardian in chivalry, doth make waste, or destruction on the lands, that is to say, pulls down the house, or cuts down timber, or suffers the house willingly to fall, or dis the ground."

Blackstone, in defining it (2 Com. ch. 18), says:—"Waste is a spoil or destruction in houses, gardens, or trees, or other corporeal hereditaments, to the disherison of him that hath the remainder or reversion in fee simple or fee tail."

Next Grady, in his work on the subject, says that "Whenever there is a particular or limited estate in lands or tenements which must, after the determination of such estate, devolve upon another, any defect in their condition is properly dilapidation, and the act of permitting or committing such defect is called waste."

An able definition is also given in Cruise's Digest, where it is said that "Although tenants for life are entitled to reasonable estovers, yet they are prohibited from destroying those things which are not included in the temporary profits of the land, because that would tend to the permanent and lasting loss of the person entitled to the inheritance. This destruction is called waste."

There are three species of waste—permissive, voluntary, and malicious.

Gibbons divides permissive waste into five sorts, thus—

- 1st.—The neglect to repair the necessary effects of time and use.
- 2nd.—The neglect to repair the consequences of inevitable accident.
- 3rd.—The neglect to repair the external or internal coverings of a building.
- 4th.—The omission to protect the fabric of the building from the consequences of dilapidations in the coverings.
- 5th.—The omission to prevent the wrongful act of a stranger.

Grady speaks of several kinds of waste, but only in his definition mentions two—namely, voluntary and permissive. Voluntary waste he defines as acts of commission; permissive waste as acts of omission.

It will be of little value to follow the nicety of distinction, as the penalty, no matter under which class they may be placed, is the same; still it may be well to remember that permissive waste consists in the neglect to supply those dilapidations which are the necessary effects of time and use, or those which are merely occasional or accidental.

Suffering houses to be uncovered whereby the rafters or other timbers become rotten, may be mentioned as an example of this class of waste; but the authorities give it that the bare suffering them to be uncovered, without rotting the timber, is not waste; so if a house be uncovered when the tenant cometh in, it is no waste in the tenant to suffer the same to fall down.

Voluntary waste consists in altering a tenement. It is no defence to say that such alteration increases the value of the property, and for this reason says Gibbons:

"That the act of alteration exceeds the right of use, and infringes on the right of the grantor, which is to have the tenement in the same condition as when granted, as near as can be; and although the alteration may increase the merchantable value, it may not be an improvement in the eyes of the grantor, or may impose upon him an additional charge to keep the tenement in good condition."

Having then fully defined dilapidations and waste, and what they are, I will next consider how they are practically to be dealt with.

B. F.

THEORY OF THE ARTS.

ARCHITECTURAL COMPOSITION. — DECORATIVE METAL-WORK.

(Continued from page 366.)

THE prejudices architects entertain towards the employment of iron as a building material are ill-founded. They have regarded it as an inartistic material, incapable of being fashioned into forms of beauty. These prejudices, however, are disappearing to the more scientific education of the day,

and since the Crystal Palace of 1851 the architectural profession, in this country at least, are not so blind to its use as they were previously. Constructively, indeed, its use and value have long since been conceded, and it has already revolutionised many branches of constructive architecture. It is its æsthetic development, and not its industrial aspect, that is so much in the rear or lost sight of. Brick and wood have of late years been wonderfully developed æsthetically. The resources and inherent qualities and beauties of each material have been brought out in a manner that our forefathers of the last century never dreamt of. The reason of this is manifest. Honesty of expression has been the principle or watchword of the designers and artisans of these materials. The motive has been reality, or "intrinsic worth" as opposed to apparent worth. In the constructive adaptation of every material the principle I have started with must be predominant—namely, that form is related to force, or, in other words, that the laws of the strength of every material resolve themselves into certain definite ratios or proportions. Thus, we have seen the relative dimensions or figures which wood or iron must assume to give its maximum work or strength with economy of material. In columns, for example, it is experimentally proved that the form of greatest rigidity or strength is a hollow cylinder, and Nature herself abundantly proves the rule in the vegetable world alone. By the way, students cannot possibly derive more useful or practical lessons in the strength of materials and the beauty of form as applied to different purposes than by observing the varieties of section or stem-form in the smaller and humbler kinds of plants and vegetables, and I believe far more valuable knowledge may be learnt in the wide fields of Nature than can be acquired by studies of art abroad, or those confined to Classic or Mediæval ages.

The hollow tube, then, seems to give the greatest rigidity in columns when the material is of a tough or cohesive nature, as wood or iron. For transverse strain, we have depth as the expression or form of strength, this decreasing by a regular law towards the points of support; and again for tensile action we have sectional area simply, which may be best expressed by a perfectly square or round solid form. Hence equality or regularity of form or area is the proximate expression for simple forces, as compression or tension; and inequality or want of uniformity the expression of composite action, such as cross strain, and these three forces comprise all the chief mechanical forces in construction. And in every case variable or composite conditions of structure require variable quantities or form; while invariable uniform or constant forces require the like expression. For columns or tension rods the round section is therefore the simplest and most economical form, though such a shape may be relieved by mouldings or flutings. The moulded and uniform sections of the pillars of the Gothic masons are instances of the beauty of adhering to this principle. There is, however, some reason for enlarging the shafts or giving the column an *entasis* or swell; it may be found in the apparent strength such a slight variation of section provides, and also in seemingly growing out of the basement of a building; Nature supplies such an analogy in the decreasing trunks of trees as they rise. In cantilevers or brackets we have composite mechanical action, or two forces; hence the form should be such as to indicate this, and any great alteration of the triangular form would appear ill-suited, as it would be contrary to the above principle. Many cast iron manufacturers forget this, and introduce designs that are radically opposed to the law I have adverted to, as well as that of common sense.

The decorative treatment of cast iron frequently sins against all principle or law, and

we are constantly seeing in illustrated catalogues of metal work, which are so profuse of late years, an utter disregard to the connections or attachments of the decorative with the constructive parts which are generally at variance; indeed, the aim of the designers has been in many instances to disguise the construction as much as possible. There is more inducement to this deception in cast than in wrought iron, as the latter in any complicated design must be constructed or depends on the rivets, and not on the mere cohesion or passiveness of the material, which can be run into or moulded to any shape fancy or caprice may dictate. Another and equally important principle in the design of cast work is that the parts or component members, as well as the design as a whole, should be chiefly subjected to compressive force rather than any other. Great or unequal strains on the parts should be avoided. There should be no weight of one part causing any tensile strain, but the parts of ornamental work should be evenly distributed, and the metal be of sufficient body to prevent easy fracture or breaking off. There should be no undue thickness of metal or ornament in any one part, but it should be so run as that every convolution, ornament, or feature should be well supported by the adjacent metal. In open scrollwork, as in ornamental gratings, gates, &c., the metal should occupy a considerable area compared with the open spaces, and these should be more of the nature of simple piercings or perforations in the metal. If these rules were attended to we should find cast iron taking its legitimate sphere of duty, and not be open to the objections often urged against it. Where economy is a consideration, cast iron, when properly applied, is specially adapted for ornamental purposes, and can hold its own. For lamp pillars, posts, stack piping, guttering, brackets, or work where moulded or stamped relief is required, not open to the objections mentioned above, no material can offer greater advantages. I cannot approve altogether its recent use for window and door heads, open as it will always be to inferior stereotyped designs, but even for these its use is preferable to bad brick arches or no arches at all. Cast iron is readily moulded or impressed in simple designs, but highly floral ones are often tame and spiritless in the extreme.

Cast iron is best adapted for fixed and immovable purposes; but where, as in gates, it is movable, the framework requires to be wrought. In small castings, such as panels, balconies, &c., the ornamentation may be close and well ramified, thus adding strength by the continuity of the metal, but in large castings there is the danger of warping or inequality in cooling. The junction of the metals in large works is often unsuccessful and inartistic, as they require so different a treatment and mode of fixing, and the aggregation of parts is sometimes quite at variance with constructive truth. The idea should be to make the cast ornament fit into and brace or stiffen the framework of wrought metal—in this manner both metals may be made to act in concert, instead of, as too often, mar one another. The object in all designs of decorative iron-work should be to make the two metals form an integral whole, assisting to support each other. In wrought work we find this must be so, as the ornament must be riveted or attached to the framework or construction, thus helping and strengthening the whole at the same time. In the old hammered work, in gates and other metal work, we find the ornamental details and scrolls riveted to the angles, thereby adding strength and ornament at the same time. In wrought work, too, through the tenacity of the metal, the ornament can be made much lighter, and more individuality, expression, and feeling can be given than possible in a material that must be run in a mould in a sufficient mass to ensure strength. These decided differences in the qualities and treat-

ment of the two sorts of metal should invariably determine for what purposes each is best suited. The cast works of an ornamental kind exhibited in 1851 and in later exhibitions show the sad want of attention to the two essential points in all good design—namely, the properties and quality of the material used, and the purpose intended to be served, points that can never be too often enforced. In all ornamental iron work, whether for separate use or forming parts of buildings, there should be a central form of treatment or principle uppermost in the mind of the designer, which must always be regulated by, first, the physical condition of the object to be designed, and, secondly, the expression or character it should it should possess. In constructive metal ornamentation, such as roof principals and girders, right lines and geometric or conventional ornamentation is certainly more in keeping than the natural or florid style of treatment, where branches, foliage, and other forms of nature are used. France, Belgium, Prussia, and Austria are rivals with us in cast metal work, displaying often a more intelligent appreciation of the essentials of good design, and sharpness and closeness of manufacture. Indeed the jury of the Great Exhibition of 1851 assigned the palm of superiority to Continental works. What can be more hideous and inappropriate than the designs for cast railings and similar works we often see? It is not necessary here to refer to the multifarious uses of cast metal work, whether utilitarian or artistic, though it cannot be denied our general ironmongery is anything but artistically treated; our ordinary grates are notably poor, though somewhat improved lately. A taste for meretricious display and gaudiness is the weakness of manufacturers; whereas by a judicious combination, as inlays of bronze, brass, or ormolu, or simple contrast produced by broad flat surfaces of plain metal, either of ground, cast, or burnished metal, a characteristic relief is obtained.

In wrought metal work or hardware an improved taste is manifested, on the other hand, mere finery giving place to constructive feeling from the very necessities imposed by the metals used. Thus in the church and other metal work recently produced, characteristic simplicity and constructive feeling are predominant. Showiness and vulgarity is the result of too easy and plastic a means of production. French artists are too prone to excessive ornament and naturalism in style, attributable to the facilities of manufacture they possess in this branch of industry.

For examples of many elaborate specimens of metal work, the reader cannot do better than refer to the splendid work of Waring—viz., his "Masterpieces of Industrial Art."

From what has been said, we may sum up the following deductions or maxims for our guidance in the employment of ironwork:—

(1.) That it should be used for purposes requiring durability, strength, and lightness, for which timber would hardly be suitable, on account of its speedy decay, combustibility, or its large scantling.

(2.) It should be used only in positions where its electro-chemical conditions are not excited, where it would not be materially affected by oxidation, to the injury of the structure to which it is united, nor where its property of expansion and contraction, under different temperatures, would affect the structure.

(3.) Wrought iron, by its greater tenacity and peculiar properties, is best fitted for structures or uses in which cross or tensile strains or jars are produced; while cast iron, constructively used, should be confined to compressive action only, and that economy is best consulted in such distinctive use of the two metals.

(4.) That the forms best suited for cross strains or any composite action are generally variable and irregular; while for simple forces or actions, regular and uniform section is best adapted. When used conjointly,

wrought and cast iron should assist each other by each partaking of its characteristic office.

(5.) As a rule, cast iron is best adapted for immovable purposes, or where fixed durable ornamentation is required, not subject to strains.

(6.) The treatment of metal work for constructive purposes should be geometric or conventional, rather than imitational, highly floral ornamentation being permissible only when not subjected to real or apparent pressure, strain, or disturbance, as in grates, panels, screens, or where the eye and mind are at rest.

G. H. G.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE second ordinary general meeting of this Institute for session 1871-72 was held on Monday evening last, the President, Mr. T. H. Wyatt, in the chair. Mr. C. L. Eastlake, the Secretary, having read the minutes of the last meeting and announced several donations and purchases for the library, the following gentlemen were balloted for and duly elected members, viz.:—Mr. Edward Boardman (of Norwich) as a Fellow, and Messrs. R. Armstrong (London) and C. H. Heathcote (Manchester) as Associates. The President then read letters from Mr. Ruskin and Mr. Butterfield, in which the writers expressed regret at their inability to be present, on the invitation of the Institute, to hear Mr. Brewer's paper read.

Mr. HEBB, Associate, next called attention to the great number of honorary foreign and corresponding members of the Institute that had been carried off by death within the last year or two, and suggested that M. Sommeiller and the other engineers associated with him in the carrying out of the Mont Cenis tunnel should be invited to become honorary members of the Institute if, as it was stated, they were architects, for undoubtedly they were distinguished men; and he further suggested that as Professor Donaldson is at present in Italy he should be asked kindly to inquire whether M. Sommeiller and his *confreres* were in reality architects.

Mr. STREET inferred, from the fact that he himself belonged to a society in Genoa which had conferred upon him the title of "honorary engineer and architect," that the two professions were combined in Italy.

Sir DIGBY WYATT said he believed that to be the case; at any rate, the educational training was suited to those who would have to follow the two professions.

The PRESIDENT said that in the absence of Mr. Cockerell, the Hon. Sec. for Foreign Correspondence, he would undertake to see that Mr. Hebb's suggestion was duly attended to. The President next read a letter from Mr. Grove, Secretary to the Palestine Exploration Fund, referring to the approaching departure of Captain Stuart for an archaeological tour in the Holy Land, and suggesting that the Institute should draw up a list of questions regarding the different antiquities to be visited, so that, if possible, any required information concerning them might be supplied. On the suggestion of Mr. CHARLES BARRY, it was decided to refer the letter to a sub-committee.

The PRESIDENT then called upon Mr. H. W. BREWER to read a paper

ON THE REVIVAL OF ECCLESIASTICAL ARCHITECTURE IN GERMANY AND HOLLAND,

of which the following is an abstract. Mr. Brewer commenced by observing that the great difficulty which exists of thoroughly understanding the modern architecture of foreign countries arises from the fact that it is next to impossible for any stranger to become well acquainted with the various causes which have influenced the building arts of those lands. He therefore endeavoured, as much as possible, to criticise the two schools of ecclesiastical architecture at present practising in Germany from their own standpoint, and not from an English point of view, trying to ascertain what they are aiming at, and where they have succeeded and where they have failed in attaining the end striven after, bearing in mind the fact that there are certain fixed laws which must never be broken, however styles may change or tastes vary. The first of these immutable laws is that an architect must be acquainted with the style in which he is working; if, for instance, he is building in one of the Mediaeval styles, he must know pretty well what the old men would have done had they had the same wants and requirements to work for that he has; and if building in a new or eclectic style, he must be thoroughly acquainted with all the elements out of which he is going to compose his style. Of the

two styles of ecclesiastical architecture at present in use in Germany. Mr. Brewer spoke first of the Eclectic or Munich style, because, by a singular contradiction, the Gothic or Mediæval school is more recent than the eclectic school; had the reverse been the case, perhaps the result might have been more happy than it is at present. Making every allowance for difference of taste, and for circumstances which may have influenced it, it was impossible to say a single word in favour of the Eclectic-Munich style—the “architecture for the future” as it had been pompously named. It is not an architecture for the future, because (firstly) it is not architecture at all, and (secondly) men who cannot compose an architecture for the present certainly cannot invent one for the future. This so-called Eclectic-Munich style is a chaotic jumble of Romanesque, Third-Pointed Gothic, Italian, pure Greek, Indian, Chinese, Moorish, and Venetian Gothic, all heaped together without the slightest considerations of necessity or propriety. In the new “Maximilianum” and the “Maximilian’s Schasse” at Munich, or the Ludwig Kirche, or any other building of the same style (of which, unfortunately, there are thousands) are to be seen badly-designed Romanesque windows, utterly devoid of all spirit or feeling, filled in with badly-designed Third-Pointed Tracery, devoid of all elegance or grace; badly-designed Moorish parapets; badly-designed Venetian Gothic crockets, crawling like so many fat slugs up meaningless sham gables; added to this, an outline like two or three cigar-boxes joined together, with one or two set up on end, all covered with nearly flat roofs composed of great sprawling tiles, and the building faced with glazed carrot-coloured brick. It is all very well to call this conglomeration of discordant elements a new and original style; but novelty may be of two kinds—a thing may be new either because no one could have done it before, or because no one would have done so before. However, the worst feature of this style is not its artistic part, but its faulty construction. The jambs of a doorway or window, 10ft. or 12ft. high, are frequently worked out of one piece of stone only about 10in. or 12in. square, and this stone beam is set on end and made to support a Gothic arch, the sides of which will again be composed each of a single stone, with a huge keystone in the centre. The absurdity of nearly flat roofs in Bavaria, where the snow is often 4ft. deep, and lays for nine or ten days, is apparent. This style, however, has carried everything before it in Germany; invented in Munich (and unfortunately not patented), it has been introduced into Berlin (where it has perpetrated dire eccentricities), to Stuttgart, Hanover, Dresden, and Carlsruhe, in all of which places it has become a great Court favourite, and has been warmly taken up and pushed by the various Ayrtons attached to those governments. Ayrtonian principles are largely developed in Germany, especially in Berlin; in fact, the interference of the German Governments, particularly those of Prussia and Bavaria, has had a disastrous effect upon architecture in those countries. As an example: When Zwirner died, the inhabitants of Cologne, the *Dom bau verein*, and the archbishop, all wished Mr. Stadtz, of Cologne, to be appointed architect to the cathedral. Mr. Stadtz is a Cologne man, and knows every stone of the cathedral; he had, in fact, worked upon the building as a mason, in order to become better acquainted with his profession, and to have a perfect knowledge of that splendid church. But, despite all remonstrances and advice, the great Prussian Ayrton forced upon the clergy and people of Cologne an architect who, of course, was a Berliner, and whose knowledge of and feeling for Gothic architecture may be judged by the little terrace with its pierced parapet and its poor little buttresses, which he has placed as a basement to this noble building, giving it a ridiculous resemblance to an elephant standing on caterpillars’ legs. Turning to the Mediæval school of German architects, Mr. Brewer said that the first really good Gothic church built in Germany was the work of an Englishman (S. Nicholas, Hamburg, by Mr. G. G. Scott). Before the commencement of that building the Eclectic school and the Italian school of Ecclesiastical Art divided the field between them. Mr. Scott’s church, however, was the commencement of a great reformation in ecclesiastical architecture; the Italian school died out at once, and a new school of Gothic architecture arose. It is noticeable, however, that although the Lutherans made the first move towards the reintroduction of Gothic architecture by the selection of Mr. Scott’s plans for S. Nicholas, Hamburg, they appear to have reaped little, if any, profit from that movement, whereas the Roman Catholics, who were later in the field, have taken great advantage of the good example set them in ecclesiastical architecture by Mr. Scott. As a rule, the new Protestant churches in Germany

are built in the Eclectic style, and the new Catholic churches in one or other of the Mediæval styles. There are, of course, exceptions to this rule; for instance, the new Protestant church at Bonn is in a kind of Gothic style, and the new Catholic church at Wiesbaden is in the “Munich-Eclectic” style. With regard to the churches built by the “architects for the future,” the first thing that strikes one is their extraordinary similarity—one would imagine that there must be a stereotyped pattern kept at Munich from which they are all cast. The only difference observable amongst them is that some of them have pinnacles and some are without. They nearly all consist of one great fat nave, covered with sprawling tile roof, with an apology for a chancel in the shape of a little apse stuck on at the east end (just as often the west end, as orientation is not observed), and a thin tower and spire over a porch at the opposite end. This tower is nearly always gabled on each face, and has a round headed window and a rose window on each side; sometimes the rose window is above the long window, and sometimes the long window is above the rose window. Iron is largely used for the window tracery and the roofs; and, in fact, wherever it can be used with impropriety and bad effect. Examples of this style of building are the Lutheran churches at Freising, Aschaffenburg, St. Goarhausen, Bingen, Ems, Limburg, Dietz, Landshut, Ludwigshafen, Mulheim, Maintz, Dondeworth, &c. The new Lutheran church at Wiesbaden is one of the largest examples of a church in this style, and its size and solidity redeem it from the usual vulgarity of these buildings. In stating that Mr. Scott’s church at Hamburg commenced a new era in ecclesiastical architecture in Germany, Mr. Brewer did not mean to say that it was by any means the first Gothic church built in Germany during the revival, for two interesting examples had preceded it—the churches at Apollinarisburg (by Zwirner), and at Au, a suburb of Munich (by Oemüller). To find the school of real German architects, one must not look for them in the capitals of the various German states; they may be searched for in vain at Berlin, Munich, Dresden, and Stuttgart; but they will be found in the provincial towns—at Cologne, Aix-la-Chapelle, Paderborn, Hildesheim, Brunswick, Fulda, and Ratisbon, where they have learnt their art in the study of the noble minsters and parish churches of their native towns. Snubbed by the Courts and Governments, laughed at by their more successful rivals, “the men of the future,” as so many antiquarians, and as being five hundred years behind the age in which they live, completely shut out from Government work in a country where nearly every great undertaking is in the hands of the Government, they have had to seek for patronage from the town-councils and clergy of their immediate neighbourhood. Amongst the architects of this school whose works approach nearest in spirit to those of the great Mediæval builders, Mr. Brewer mentioned the names of Mr. Stadtz, of Cologne; Mr. Guldenpfennig, of Paderborn; Mr. Denzil, of Fulda; Mr. Deuzinger, of Ratisbon; Mr. Kleinertz, of Cologne (whose superb decoration of S. Maria zu Capitol and other churches at Cologne, and S. Catherine’s at Utrecht, are works of the very highest excellence in decorative art), besides two other gentlemen, one at Hildesheim and one at Brunswick, whose names Mr. Brewer had forgotten. Dr. Bock, of Aix-la-Chapelle, and Dr. Reichensperger, of Cologne, deserve also to be mentioned for their many admirable works upon Gothic architecture and church furniture; and Mr. Baudri, of Cologne, for his attempt to restore stained glass to its proper use and character, in opposition to the gaudy and vulgar transparencies of the Munich school. The chief works of Mr. Michel Stadtz, of Cologne, are the new cathedral at Lintz, on the Danube, an immense church 420ft. long and 200ft. across the transepts; S. Mauritius at Cologne, 220ft. long and 160ft. across the transepts; and new churches at Aix-la-Chapelle, Mulhaus, Caevlear, and Eupen; and (as an example of German Domestic Gothic) the new building called the “Karlsruhe” at Aix-la-Chapelle; the latter, like all Mr. Stadtz’s work, is Early Second Pointed. The works of Mr. Guldenpfennig, of Paderborn, are, to Mr. Brewer’s thinking, the most satisfactory examples of modern German Gothic that he had seen. As Mr. Guldenpfennig is a young man, Mr. Brewer thinks that great things may be expected of him. He has been appointed Diocesan Architect to the Bishop of Paderborn, in which capacity he is restoring the fine cathedral of that town in a most skilful and excellent manner; in fact, it will, when completed, be the most thoroughly satisfactory restoration in all Germany. A new school, a college, and several dwelling-houses in Paderborn, by the same architect are all excellent, and his two fine churches at Hoerde and Budrich, and a

small chapel at Wyver are also full of spirit, and show a thorough feeling for Gothic architecture. The beautiful Lieb Vrouen Church at Munster is being restored by the same able hand. Mr. Deuzinger, of Ratisbon, is best known by his design for the completion of the exquisite cathedral church of that city. Of the works of Mr. Denzil, of Fulda, Mr. Brewer is acquainted with one only, viz., the restoration of the Benedictine Church in that town, which shows a greater knowledge of Gothic architecture than is shown in most German restorations. Of the ecclesiastical architects of Austria, Mr. Brewer mentioned the names of Professor Schmidt and H. Ferstel, both of whom have taken an active part in the revival of Gothic architecture in that country. The Votive Kirche at Vienna, by Ferstel, was certainly the first modern Gothic church worthy of the name commenced in the Austrian dominions; and the Lazarist church at Vienna, by Professor Schmidt, is certainly a very satisfactory Gothic church: his churches at Weissgraben and Fischerholt, near Vienna, are less admirable; and his design for the new Townhall at Vienna is in a mixed style of Gothic and Italian, which, in Mr. Brewer’s opinion, is not an advance in the right direction, although it is vastly superior to anything of the kind that has been done at Munich.

Passing on to notice the Dutch revival, Mr. Brewer said that twenty years ago there was no such thing as ecclesiastical architecture in Holland of any description whatever; both the Protestant and Roman Catholic churches consisted of four walls, with a pepper box at one end and an altar or reading desk at the other. About twenty years ago a revival of Gothic architecture commenced amongst the Dutch Roman Catholics, which, for enthusiasm, boldness, and liberality has certainly had no equal in Europe. Whether we regard the great number of churches, their completeness, or the important dimensions of many of them, it seems marvellous that they could have been erected by people numbering little more than one million. Nor has the movement been confined to building new churches only, for nearly all the ancient churches and cathedrals that have remained in the hands of the Roman Catholics have been restored or are undergoing restoration. The cathedrals of Maestricht and Roermond are being excellently restored by Mr. Cuypers. S. Catherine’s at Utrecht, originally the Carmelite church, but now the Roman Catholic cathedral of that city, has undergone a thorough restoration by Mr. Van der Brinck, and has been most beautifully decorated by Mr. Kleinertz, of Cologne, and fitted up with carved oak stalls, sedilia, bishop’s throne, altars, and pulpit by Engleberger, of Aix-la-Chapelle. The cathedral of Bois-le-Duc, the most magnificent building in Holland, is also undergoing a thoroughly well-intentioned, but not altogether judicious restoration by Messrs. Herseman and Vennemans, of Bois-le-Duc. The ancient churches at Venloo, Boxtel, Stard, Rolduc, and S. Walburg, at Arnheim, are being admirably restored by Mr. Cuypers; and the beautiful church of Our Lady at Roermond, the finest example of the late Romanesque and Transitional styles in Holland, is being thoroughly restored and completed by the same architect, all the designs for this restoration having received the approbation of M. Viollet-le-Duc. With regard to the works of restoration carried out in the churches belonging to the Dutch Calvinists little need be said. The church at the Haghe has had a cast iron spire and pinnacles added to its tower, and the whole of the exterior has been neatly plastered! The grand cathedral at Utrecht has had two new galleries in the form of the boxes of a theatre erected in its superb transepts, while its forlorn but graceful choir is still unoccupied. The great church at Gonda is having its west front neatly restored in stucco, while the great church at Rotterdam has been embellished by the addition of plaster quoins. The noble tower of the great church at Breda is being patched up, but the fine lantern over the crossing was wantonly destroyed some ten years ago. The beautiful monument of John of Nassau in this church has fortunately been restored by Mr. Cuypers. The first really successful new church erected in Holland was Mr. Cuypers’s church at Wyck, near Maestricht, commenced some fifteen years ago. Of this architect’s churches the most remarkable for completeness and decoration are those of Vechel and Eindhoven. His other churches are at Breda, Oudenborch, and S. Willebrord at Amsterdam, all large buildings. Mr. Cuypers’s churches have at first a singular appearance to an Englishman, on account of their excessive nationality; they are very square in composition, very regular, and much more plain externally than such buildings are with us; then they are all built of brick, with stone very sparingly used, and they have a lightness of construction which strikes an Englishman as being

peculiar; but when one comes to examine them, and compare them with the ancient Dutch buildings, one is bound to acknowledge their thoughtfulness and their thorough common-sense. Of course a church built with heavy columns and thick walls would simply sink through the soil in Holland, and the more lightly a building can be constructed, and the less material used in its construction, the more durable it is. Among other Dutch architects who have taken up the Gothic style of architecture are Mr. Weber, of Roermond, Mr. Van der Brinck, Mr. Van Tolda, and Mr. Marjerij (a pupil of Mr. Cuypers), but they have not been so successful in their work as Mr. Cuypers. Fortunately, however, the Dutch have set their faces against "Eclecticism," and the Roman Catholic churches are nearly all built in the Gothic style, while the new Protestant churches are in the genuine old conventicle style, or the more objectionable "churchwards' Gothic" of eighty years ago. In conclusion, Mr. Brewer said: I have spoken strongly against eclecticism as practised in Germany, but I do not wish it to be understood that I am speaking against eclecticism in the abstract. Were I to do so, I should be simply raising my voice against the inevitable, for if architecture is to have a future, and if there is to be a new style, that style must be more or less eclectic. But what I do protest against is men who, without understanding the architecture of the past or present, attempt to invent an architecture for the future; and I feel convinced that those gentlemen who for many years past have laboured so hard to become thoroughly acquainted with the architecture of past ages are doing far more to found a new style than those who, discarding all the experiences of their ancestors, try to evolve a new style out of their own imaginations. Those who have gone before us have left us three great styles of architecture—the Greek, the Gothic, and the Renaissance, and these are to architecture the primary rays of light. The Gothic, with its golden excellence, is the yellow ray; the Greek, with its pure beauty, is the blue ray; and the Renaissance, with its gorgeous splendour, is the red ray. Time may combine these rays and make them daylight in the dawn of the real architecture of the future.

DISCUSSION.

In the discussion which followed,

Mr. STREET said he agreed with the general tenour of Mr. Brewer's paper, though he had but little acquaintance with modern German work, for when he had turned his attention to it on past occasions, he had found it to be of the most wretched description; but from the drawings exhibited he considered that Mr. Guldenpfennig's work was particularly good, the result, doubtless, not only of that architect's talent, but of his good fortune in living in a town of such peculiar value to the architectural student as Paderborn. With Mr. Cuypers's works the speaker had a better acquaintance, and could thoroughly confirm Mr. Brewer's estimate of them. Mr. Street next alluded to the fact of the Germans having continued to build in the Romanesque style to a much later date than other nations, and then borrowed and developed a style from France (the Late Middle Pointed). These circumstances had been prejudicial to the progress of architecture in Germany. Regarding the restoration of Cologne Cathedral, he thought it unsatisfactory, and that when complete the building would be extremely more uninteresting than it was as a fragment. This restoration affected and influenced almost all the great works of modern German architecture. The Votive Kirche at Vienna was an exceedingly complete academical work, but he thought it very uninteresting and very unlike the sort of work that would be seen in France or England under similar circumstances. Modern German Gothic work, as a rule, was execrable. It was gratifying to know that an English architect had, as stated by Mr. Brewer, been the pioneer of a better state of things. He (Mr. Street) agreed with Mr. Brewer as to the wretched nature of the Munich glass, and he thought that as architects they should most emphatically protest against its use in this country. (Applause.) The Munich glass sinned against every canon that could be laid down for the proper treatment of glass in windows, and was infinitely worse than the glass obtainable in England. Its adoption by British architects had entirely destroyed the fine interior effect of Glasgow Cathedral, and threatened to be equally disastrous at St. Paul's. (Applause.)

Sir DIGBY WYATT, in proposing a vote of thanks to Mr. Brewer for his paper, expressed his general concurrence with the remarks made therein.

Mr. DAWSON, in seconding the proposition, referred to the admirable red brickwork to be seen in good modern German work, and described the manner in which, in the bad work, the building is coated with stucco, and then painted and lined to imitate such red brickwork. This sham brickwork

was most admirably done, the various shades and gradations of tint being most artistically rendered. (Laughter.)

Mr. L'ANSON, in supporting the proposition, expressed a doubt whether the "Eclectic-Munich" architecture condemned by Mr. Brewer really was a mixture of so many styles as stated. His (Mr. L'Anson's) own impression was that it was merely an adaptation of Byzantine; and when in Berlin and other German cities he had seen buildings in that modified style which he considered really fine as works of architecture.

Mr. GOLDIE having supported the vote of thanks to Mr. Brewer,

Mr. WATERHOUSE referred to a peculiar style of brickwork which was carried out in some of the best modern German work. The joints were three-eighths of an inch thick, and set back three-sixteenths of an inch from the face of the brickwork. The effect was most admirable.

The PRESIDENT, after briefly expressing his approval of Mr. Brewer's paper, put the proposition to the meeting, and it was carried by acclamation.

Mr. BREWER, in replying, said that exactly the same style of brickwork as that referred to by Mr. Waterhouse was adopted in much of Mr. Guldenpfennig's work, and, in addition, that architect left his putlog holes open, which added greatly to the picturesque effect of his buildings, besides being very convenient in the erection of scaffolding for repairs, &c.

The proceedings then terminated.

ST. AUGUSTINE'S CHURCH AND MONASTERY, JOHN-STREET, DUBLIN.

THE accompanying lithograph represents the south-east view of the building, which is by far the most important ecclesiastical work erected in Dublin since the Reformation. When finished the church will measure 170ft. in length, by 70ft. in width, not including the transept, and it is 92ft. to the ridge of the nave roof. At present the western end and spire, and about two-thirds of the entire length, are completed. The exterior of the building is of Dublin granite, whilst the windows, dressings, &c., are out of Whitehaven red sandstone, which is found to stand the Irish climate admirably, and forms a pleasing contrast with the gray granite. The sides of the church are comparatively simple in design, bordering as it does somewhat narrow streets, but the west end (a view of which we hope shortly to publish), situated in Thomas-street, is more dignified, especially the western arch, encompassing as it does the great rose window and the principal entrance. The arch itself rises to a height of about 70ft. The windows in the western transepts possess double tracery, which creates a somewhat overcrowded effect. The windows of the belfry are filled with immense louvre boards, such as are often found in Continental churches, where they were used more from necessity than for effect, but the result is never displeasing, however crudely they may have been applied. The spire itself is principally of grauite, which terminates in three wrought iron and copper crosses of great height. At present the interior is entirely unfinished; of this we need only mention that the columns, bases, &c., are of red marble. Up to the present time about £30,000 have been expended. The architects are Messrs. Pugin & Ashlin.

EARLY BUILDING SOCIETIES IN BIRMINGHAM.

DR. J. A. LANGFORD read a paper on this subject at the second meeting of the Archaeological Section of the Midland Institute, held last week. The lecturer, after some introductory remarks contended that the assertion which had been made that the principle of co-operation did not find favour with the people of Birmingham was founded upon a misapprehension. The principle had been acted upon by the large and prosperous building societies of the town. Birmingham was really the birth-place of these institutions, which had been productive of so much good. In Birmingham the members of building societies now numbered from 12,000 to 14,000, and of these about 95 per cent. belonged to the working classes. In the year 1767 an offer of some fee land was made to any person who would build and "carry on a considerable trade there"—(a laugh)—but the earliest record of a building society which the lecturer had been able to find was dated 1781. It had been stated by an old writer that at the time of the Restoration Birmingham consisted probably of only three streets, but Hutton had put the number of the streets at that time at fifteen, and the number of houses at 900, and this

was confirmed by a paper preserved in the Record Office—a letter from the Justices of the Peace for the county of Warwick to the Sheriff, on the breaking out of the plague in 1631—in which it was stated that Birmingham was "a great market town." In 1780 the number of houses had increased to 8,382, and within a year of that time the first building society was established. Building societies were very numerous in the latter part of the last century, and a great impetus was given to the growth of the town. In 1791, a society was founded at the house of Mr. Keeling, licensed victualler. It had for its object the raising of a sum of money for erecting buildings on a piece of land called the Round Hills, near Walmer-lane. A similar society was established in the same year at a public-house kept by Mr. Mantle, for promoting the erection of buildings on the Round Hills, Aston. These societies were designated in the deeds, "The Joint Concern, Club, or Society," though they were described at the commencement of these documents as building societies. The effect which several of these earlier societies had upon the growth of the town was very great. Something like £2,000,000 had been paid into societies of this kind since 1847, when the first of the existing building societies was formed, and it was estimated that there were no less than 13,000 houses belonging to artisans.

SLATE AS A SUBSTITUTE FOR LITHOGRAPHIC STONE.

AN improved process and composition, whereby slate and various other materials are made to serve as substitutes for lithographic stones, have been invented by Mr. J. N. Lambert, lithographic artist, of Castle-street, Bristol. He takes a block or slab, made smooth and true, and coats the same with glue or other gelatinous matter. In some instances he adds a solution of silicate of soda and bichromate of potash, or he may use this solution alone. The block or slab is then exposed to sunlight, and then washed, to remove the superfluous coating; then, after being dried, the said block or slab is ready for drawing or writing upon. He makes an ink or pigment with gelatine, albumen, or other gelatinous matter dissolved in a saturated solution of bichromate of potash, either with or without chrome alum, and with a small quantity of ivory black to render the ink visible. He then produces on the prepared block or slab the desired picture or other work with this ink, and allows the same to dry. When dried he exposes it to sunlight. After the exposure he covers the surface with gum or glycerine. The block or slab is then ready for the printer.

THE NEW LAW COURTS.

THE dark weather and other causes have obliged us to postpone the publication of the illustration of the public stair to the galleries in the Strand front. This will appear in our next issue, and will be followed successively by the Eastern portion of the Strand front, and by the Eastern or 'Bell-yard Elevation. There was a difficulty in making the photo-lithograph which we published last week, owing to the tints on some portions of Mr. Street's original drawing. The consequence was that some portions did not print well, and in course of amendment by hand were somewhat altered. This was especially the case in the heads of the windows, where the solid tympana are in many cases wrongly shaded so as to make it appear that they are pierced.

S. BARTHOLOMEW'S HOSPITAL.

ELECTION OF SURVEYOR.

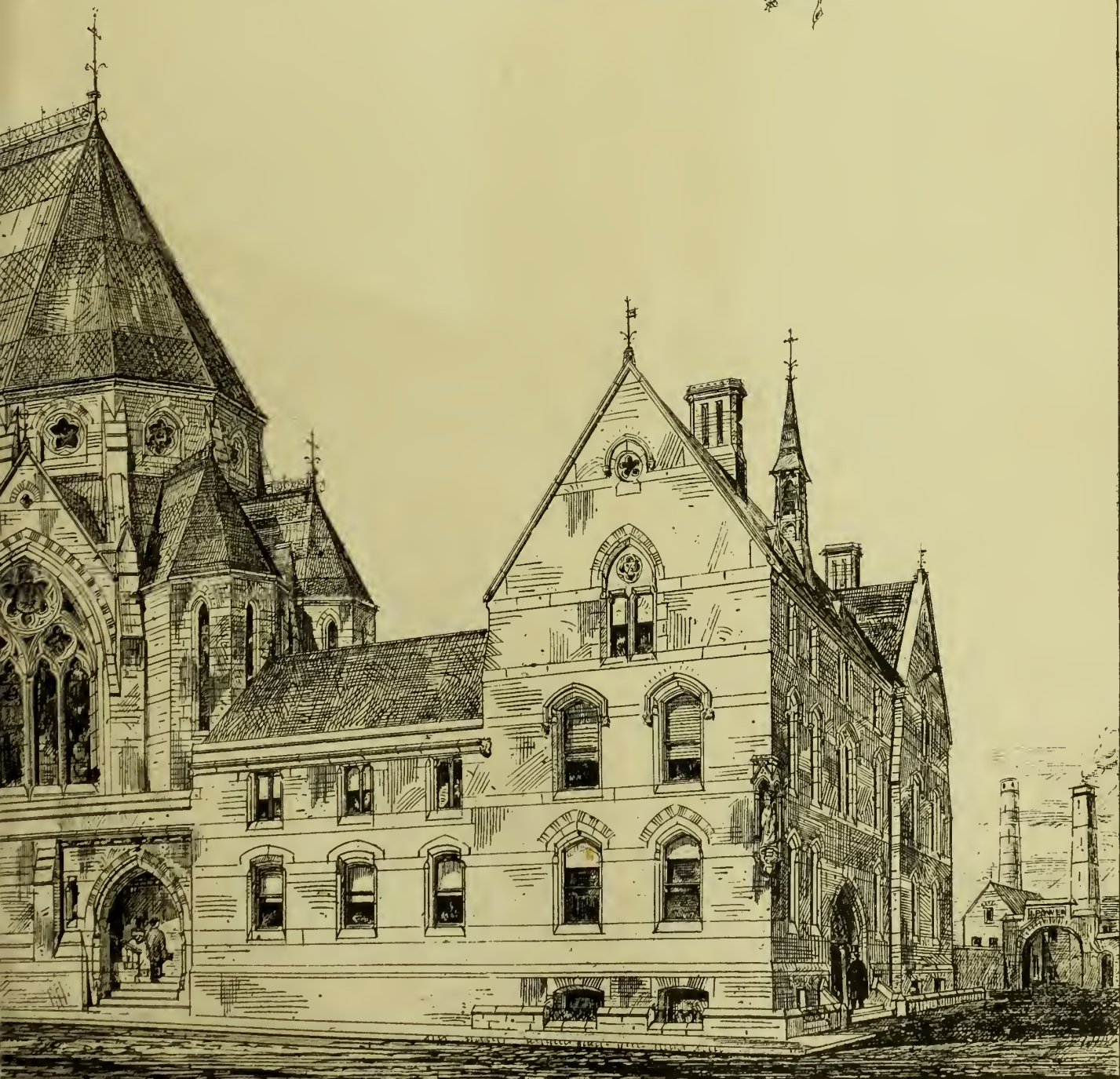
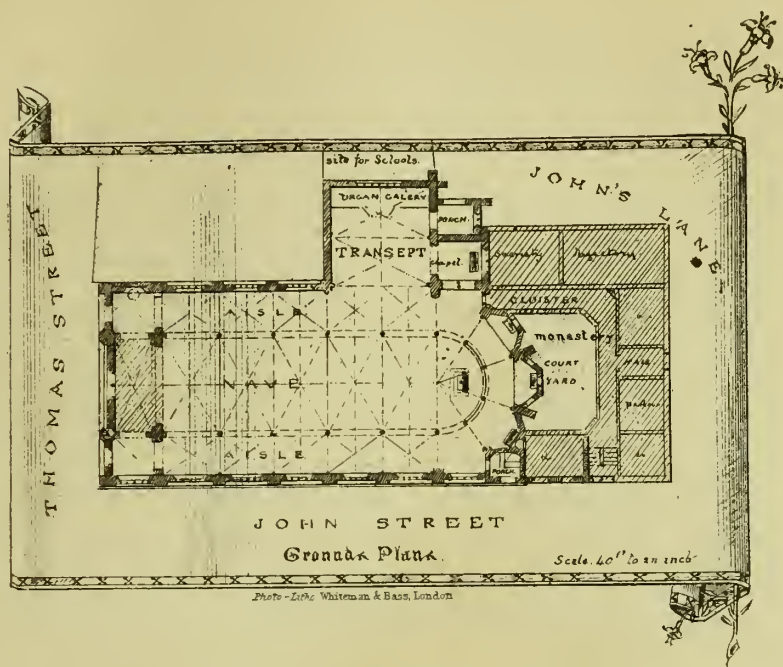
THE office of Surveyor to this institution is vacant through the resignation of Mr. P. C. Hardwick, who held the post for many years. As is usual in these cases, there are numerous candidates for the appointment. Mr. Charles Barry, Mr. Marable, Mr. Gardiner, Mr. Henry Archer Hunt, jun., Mr. W. F. Meakin, Mr. Edward L'Anson, and Mr. E. N. Clifton are some of the names that have transpired as seeking the suffrages of the governors. The contest will in all probability be chiefly confined to the last two gentlemen, who have both very influential supporters.

A meeting of the House Committee will be held at the hospital on the 5th of December, when three names will be selected and returned to the general court for approval by them. The election will take place on Monday, the 18th of December.

The salary of the Surveyor is 300 guineas a year, with a commission of 2½ per cent. on all buildings erected under his superintendence, and a fee of a guinea for every plan on a lease.



VIEW OF AUGUSTINIAN CHURCH



Fine Arts.

SOCIETY OF PAINTERS IN WATER-COLOURS.

THIS society opened its usual winter exhibition of what the catalogue calls "sketches and studies" on Monday last. We confess that we do not exactly see the import intended to be raised by the words so employed as distinguishing the character of the exhibition from the larger and more important display provided for the summer. There are certainly fewer large and highly-finished works on the walls than we see in the summer; but of "sketches and studies" properly so-called, passing efforts which pourtray the first suggestions in an artist's mind and the progressive stages by which he matures them in the form of a perfect work, we find but few examples. If "sketchiness" mean simply careless unfinished, there are indeed many examples of that quality in the collection; but, on the other hand, there are a considerable number of highly-wrought performances, which would be as suitable for a summer as a winter's display. In very many instances, indeed, the artist, instead of applying himself to labour for the occasion, appears to have ransacked his portfolios and drawers for remnants of earlier years, which might not, perhaps, have stood the test of publicity on their simple merits at the time of their execution, but to which the fame since achieved by the artist has given a market value. The miscellaneous nature of these waifs is exemplified in the manner in which they are put together three or four in a single frame, yet being inspirations of landscape from wholly distinct and distant localities, bits from North Wales, Cumberland, and South Devon going hand in hand with others from Italy, Switzerland, and Spain, simply because in point of size they happened to suit the occasion. Of course there are many admirers of Birket Foster, Collingwood Smith, H. Gastineau, and other favourite landscapists who would not object to come by a "job lot" of their minor performances thrown together in this manner, reserving to themselves to separate them at pleasure hereafter; and so, supposing a sale to be effected, the main purpose of the exhibition may be said to be achieved; and no one has a right to complain.

Looking at the exhibition in the abstract, we are glad to observe that, although some of the leading men who, in the summer, occupy the giant's share of the walls with large and elaborately-finished works, are now represented by small and comparatively unostentatious works, there are others whom the blaze of summertime has thrown partially under the shadow of their larger compeers, who now come forward with well-conceived and ably-executed subjects, which at once command attention and give good augury of the future. Some of these we shall have the pleasure of mentioning as we proceed.

J. Gilbert, the worthy President, has six exhibits, two of which, occupying the places of honour, face to face, are scenes of military adventure of the chivalresque period. In the larger work, illustrating the passage from the fifth canto of "Marmion," beginning:—

"They close, in clouds of smoke and dust,
With sword-sway and with lance's thrust,"

the bustle of the conflict, in which infantry and cavalry are intermingled, is, as regards the general effect, cleverly realised, and it is only when we come closely to examine the details that we find that, as regards the actual amount of motion in the confused *mêlée*, we have been the victim of a delusion, the principal personages, man and horse, having very much that appearance of suspended action which one observes in a well-trained model. We would recommend to Mr. Gilbert a careful and appreciative study of Leonardo da Vinci's celebrated cartoon of "The Battle for the Standard" before proceeding with other works in this line. In his other

work, "Halt of Cavalry," there is not the same occasion for actual motion, but Mr. Gilbert's horses, even here, might be better drawn, and show aptitude for motion. Carl Haag has four small figure subjects, of which one, "Una Sposa d'Arvido," singles itself out from amidst a mass of cold landscapes by its glowing colours. E. Lundgren contributes both architectural sketches and figures. His "study" of the heads of two sisters looking down with pleased interest at some object not represented, is charming for its intelligent and graceful treatment, and almost equally commendable is his other presentment of the same young ladies contemplating a miniature. His tiny sketch, "At Toledo," is a gem of picturesqueness, both as to architecture and figures. J. D. Watson evinces much poetry of intention in his landscape and figure subjects, but is unequal in point of execution. "Over the Border" represents a group of horsemen descending into a wooded hollow, romantic in suggestion, but the dappled evening sky is preternaturally furious. "Windfalls," representing a girl gathering sticks in the recesses of a tangled and mossy wood, exhibits admirable handling in every part. Again, "Day Dreams," representing an intelligent little girl, with a thick profusion of reddish auburn hair, in a white muslin dress, is full of spirit and truth; whilst the more ambitious "Study" of a young lady in a green velvet dress is not by any means so successful, the left arm and hand, which latter carries a fan, being faulty in drawing. We admire the flesh tints and modelling in F. Smallfield's "Chiaretta," though we cannot take any interest in the doll-like and insipid features of the sitter. C. T. Dobson's "Rowena" wears an expression of melancholy most tenderly realised by the artist, who, however, to our mind, is more successful in the happier features of his "German Peasant Girl," which denote self-reliance and content, as she walks on her way with a load of green fodder on her shoulder. A. H. Marsh occupies a considerable space in one of the corners of the room with a strange conceit, which he denominates "The Garden." We have here a long garden bench, upon which are seated a queer-looking Paterfamilias and his five more queer-looking daughters, all in Mediæval costume, and all in a row, conversing together two and two, whilst the long-legged son of the house sits a little off, on the bend of the bench, listening to each and all in turn. There is much good work bestowed upon this incomprehensible affair. E. K. Johnson's "Girl in a Black Silk Dress," though at a first glance a work of small pretensions, proves, upon close inspection, remarkable for its painstaking, artistic finish, and the excellent keeping which pervades it. There is not a more perfect piece of work of the kind in the room; but its kind is not the highest, the interest being purely materialistic. Happier in spirit and purpose, and perhaps equal to it in the mastery of minute and feeling handling, is F. Walker's pretty little "Housewife," sitting shelling peas in the pleasant little background of a small old-fashioned dwelling-house, with a water-butt, flower-decorated window, and various articles of domestic economy detailed with a nice appreciation of their importance. F. Tayler's "Woodland Hunting—Full Cry," is a repetition of what we have often seen before in sporting print-shops. G. J. Pinwell is fond of indulging in strange, cynical parables on humanity and human affairs, set forth in a dry archaeological spirit. "Time and His Wife," representing an aged couple gravely making hay, all alone by themselves, after a passage in the "Uncommercial Traveller," is a suggestion of death in the midst of life, or the converse, grinsly carried out. "The Earl of Quarterdeck," who vowed to the lady fair working with him at the helm of a storm-tossed bark that she was one in whose company "a man would sail to hell," to which she replies by suggesting "heaven" as a port of destiny,

after which she stood with him with her hand on the tiller till dawn, after an ancient ballad, is but a wild dream, which, while very able in the skeleton of the design, and effective at a distance, is, when you come to look into it, a "misshapen chaos" of unintelligible forms. In such extravagances as this we overpass the line which separates the sublime from the ridiculous. Let Mr. Pinwell get rid of the affectation of representing things in other than their true form and colour, and he may yet do good work.

In architectural subjects, which are many in this exhibition, we must award the foremost place to W. W. Deane, whose "Porch of San Fermo Maggiore, Verona," is a masterpiece of perspective and aerial treatment. The porch is approached by steps, and all varieties of marble, brick, and stone employed in the structure are represented with an unostentatious truthfulness which evinces a sound appreciation alike of the individual materials and the general contour. The same may be said of his "Old Bridge of Stirling," though different in character, and of many others which we have not space to particularise. The "Remains of the Roman Forum at Arles" are effectively rendered, under an effect of moonlight, with occasional lights from the windows of houses, &c., by G. A. Andrews. "The Town-hall, Como," by E. A. Goodall, representing an arched area, with a court beyond, is most skillfully treated. His "Procida, Bay of Naples," and "Porto Venere, Gulf of Spezia," are scenes of a brighter character, in which he is equally successful. Samuel Read's "Rouen," a street scene in a quaint old Gothic town, shows most careful copying of actual objects, but no soul in their rendering. W. Callow has a picturesque view of a quaint old corner in the ancient part of the city of "Frankfort" represented with a true feeling for the subject. J. Burgess has a grand rendering of the "Cathedral at Tournai, Belgium," its lofty towers rising majestically to the skies, and all details faithfully noted, without any appearance of frittiness.

As a matter of course, landscape subjects hold a large preponderance in an exhibition of this art, the principal contributors being C. Smith, Birket Foster, D. Cox, jun., T. M. Richardson, E. Duncan, and Paul J. Naftel, but there are few performances from their hands, except occasional too obvious carelessness, which call for especial notice. They are doubtless reserving their forces for the grander display in May. Francis Powell's "Off Brodrick Bay—Misty Morning" is effective, but would have been more satisfactory if the effects had been produced by other means than scraping. His "Rough Sea—Early Morning" surges grandly, the broad hollow of the wave receding into the distance, until lost in shadow. H. Gastineau has drawn from his portfolio "a study for a picture painted thirty years," of "South Stack Lighthouse, near Holyhead." It is, however, but a mere sketch, very loosely put together, many passages, including the indications of intended figures, being obviously only jotted down as memoranda for the guidance of the artist in his after-work, and therefore hardly suitable for public exhibition. There is a great deal of fine tone and able handling in J. W. North's "Beechen Hollow," and a picturesque intensity in his "Black Alder Bushes," but the single figure in the latter is feebly put in, and mars the general effect. Alfred P. Newton must work under strange atmospheric influences—he has "A New Forest Cottage, Hampshire," painted in Prussian blue; and by patching a white wafer or a streak of white paper on a uniform black surface, he imagines that he realises the effects of "Moonlight" falling upon a placid lake in Argyllshire. Birket Foster is eminently successful, in his broader style of handling, in "The Falls of Tummall,"—a fine combination of rushing water and wild foliage, the generally cold tone of which is agreeably qualified by a faint gleam of sun-

shine. "On the Garry" is another picturesque scene, represented with powerful effect; but here, unfortunately, body colour has been used in excess. We conclude with a word of hearty commendation of Basil Bradley's two spirited representations of "Otter Hounds," which are equally admirable for the character of the scenery as of the sagacious animals who are the heroes of a successful field day. O.

ARCHITECTURAL ASSOCIATION.

THE second ordinary general meeting of this Association for session 1871-72 was held on Friday evening last, at No. 9, Conduit-street, Mr. J. Douglass Mathews, Vice-President, in the chair. The minutes of the last meeting having been read and confirmed, the following gentlemen were duly elected members of the Association, viz., Messrs. J. J. Lough, F. Bacon, W. H. Cobb, and A. S. Anderson. Mr. H. C. Boyes (Librarian), having announced some contributions to the Library,

The CHAIRMAN called upon Mr. W. R. MALLETT to read his prize essay, being

A MONOGRAPH OF WILLIAM OF WYKEHAM.

The monograph, which was extremely voluminous (extending over 85 pages of closely-written quarto paper) had to be cut down for reading, in order not to exceed the usual time; but we give as concise a summary as possible of the whole, dealing mainly with the architectural aspect of Wykeham's life, for Mr. Mallett's essay is a comprehensive monograph of Wykeham in all his three distinctive characters and capacities of architect, statesman, and prelate. By way of introduction the essay deprecated the tone of much of our modern biography, inasmuch as it lost sight of the wisdom, truth, manliness, humility, contentment, and courtesy of its heroes, and invited its reader's attention to mere greatness (that word of doubtful meaning), wealth, renown, success—nay, more, to cuteness, shrewdness, and other "meaner virtues," if such they might be called, moral worth being thus too often eclipsed by worldly honour. The essayist then glanced at the state of Gothic art in this country at the time of Wykeham's appearance in the arena. In his time it had long ago emancipated itself from the half-Classical trammels of its earliest phases, and by the force of its own inherent expansive power had arrived at perfection. Nearly all authors were agreed that the architecture of the middle ages attained its greatest perfection, considered as a whole, about the time of Edward I. That was its zenith; all that was done afterwards was a decadence from its excellence. Wykeham saw the approaching decline, and though his was a master-mind, he was, of course, powerless to stem the torrent—no one man could have done it. Though he followed in the main the architectural peculiarities of his age, there were many evidences in his works of his looking backwards to the good age gone by, and of his appreciation of the special beauties of its buildings, which beauties, indeed, he endeavoured to reproduce in his own works. He might well be called "the evening star of Gothic art." All the best things in Gothic architecture had been invented previously to his time—its flowing tracery, its niches and statuary, its crocketed ogee canopies, its superb arcading, its clustered shafts, and its exquisite carving; and its richest and most delicate mouldings were things in common use; there was perfection in general design and proportion, as well as exquisite finish and delicacy of ornamentation. William of Wykeham, or William Wykeham, as he was sometimes called, was born in the year 1324, his parents being probably of the class now called tenant-farmers. Whether his name Wykeham was a genuine surname, or whether he received it from being born at the village or township of Wykeham, which was about fifteen miles from Winchester, was doubtful. The history of his early life was shrouded in darkness. It was known, however, that he was sent by Nicholas Uvedale, then Governor of Winchester Castle, to the Winchester Grammar School, where he went through the then usual course of study in languages and mathematics. The Winchester of those days must have been a pleasant place to live in, full of quaint interesting relics, and just the place to mould the mind of the young architect. The old Norman Cathedral had grown venerable by that time, and was hemmed in by many noted monastic buildings and churches, the whole backed up by the Castle, with its massive walls and frowning machicolations. Wykeham was noted for his piety as a youth and his diligence as a scholar. As a mathematician he was spoken of as another Euclid, and his works displayed great geo-

metrical knowledge. Some writers asserted that Wykeham went, after leaving school, to Oxford, and spent six years there in study, but this Mr. Mallett regarded as improbable, nor was it borne out by any direct testimony. It was far more probable that as soon as he left school he was taken into the service of Uvedale, as private secretary or general man of business; indeed, it was certain that he was thus employed in 1352. It was matter of history that great repairs, alterations, and additions to the Castle of Winchester were made at about this time. Who directed those works? There was no record of any architect of note at that date; at any rate, none were recorded as being at Winchester. Wykeham was resident at the Castle, and though we were not precisely told that Wykeham was the architect who superintended the works at Winchester, there was little or no doubt as to his being so; for a few years after (i.e., in 1355) he had earned for himself the title of "the most distinguished architect in the country." Where could he have practised and exercised his skill in order to gain this title, save at the Castle? There could be no reasonable doubt that Wykeham had charge of those works, and thereon made his first essay at architecture. The Castle and all that belonged to it have been destroyed, however, till scarcely one stone has been left upon another, save the chapel of Early English date (no part of Wykeham's work), which has been mutilated and turned into Classic County Courts! During Wykeham's residence at Winchester he was probably employed on several occasions by William de Edington, bishop of the diocese, and there was little doubt that the little which that prelate did towards rebuilding the nave of his Cathedral was designed by Wykeham. Wykeham was one of the first instances of an "architect and surveyor" in full practice as an architect pure and simple. Until his time bishops, abbots, and monks monopolised the work of the profession, and necessarily so, as clerics were the only men who possessed sufficient education to fit them for that work; in Wykeham's time, however, they were few in number compared with what they were in former times, and the laity, rising in intelligence and influence, became henceforth the architects and builders. Wykeham, probably early in life, was introduced by Uvedale and Bishop Edington to Edward III., and by the time he was thirty-two years of age had established a reputation as an architect; in 1356 he was rewarded by the king with an appointment as "clerk of the king's works in his manors of Henle and Yeshampstead;" in the same year he was made "surveyor of the king's works at the castle and in the Park of Windsor, with power to press all sorts of artificers, and to provide stone, timber, and all other materials, and carriage." The Castle of Windsor, begun by William the Conqueror and enlarged by Henry I., had at this time become old, and probably inadequate for the requirements of Wykeham's times, and Wykeham razed nearly the whole of the then-existing buildings and rebuilt them; excepting as to plan and general arrangement, however, very little of his work now remained. His pay for this work was at first one shilling per day when at Windsor, and two shillings when he went elsewhere, with an allowance of three shillings per week for a clerk; but about a year after his salary was increased by one shilling per day. This sum, reduced to the present value of money, would make his full pay about £700 per year. The king was highly pleased with Wykeham, and continued to heap honours and wealth upon him. In 1359 he was appointed "Chief Warden or Surveyor of the Royal Castles of Windsor, Leeds, Dover, Hadham, and of the Manors of Old and New Windsor." The King was then busy with Westminster Palace, St. Stephen's Chapel, and the Tower of London, and Wykeham not improbably assisted in those works. In 1361 he commenced the erection of Queenborough Castle, in the Isle of Sheppy. Owing to the exigencies of his times, and impelled by his own devout nature, he, in 1361, grafted on to his occupation as an architect that of an ecclesiastic. In that year he was ordained acolyte; in the following year he was made sub-deacon and (a month later) he was ordained priest, thus very rapidly advancing from one grade of cleric to another. His preferment was no less rapid; the king preferred him to benefice after benefice, so highly was he esteemed by his royal master. During the time he held these benefices, he was constantly restoring and rebuilding churches. He held most of his benefices until he was appointed Bishop of Winchester (succeeding Edington), when, of course, he resigned all other appointments, as well ecclesiastical as civil. In 1363 he was made Warden and Justiciary of the King's Forests on this side of the Trent. He was appointed Lord Keeper of the Privy Seal in 1364, and from that time rose rapidly

in importance. In 1367 he was appointed Lord High Chancellor of England, at the same time being consecrated Bishop of Winchester. He resigned the Chancellorship in 1370, when the Parliament advised the King against the practice of ecclesiastics holding high office in the State. He continued, however, in the Government. By the death of Edward the Black Prince in 1376, he lost a great friend. Edward III. had then become old and infirm, and, jealous of Wykeham's advancement, the courtiers, headed by the Duke of Lancaster, tried to damage the character of the late Chancellor. Unlike so many men in his station of life, however, Wykeham had never sold himself, his honour, or his integrity, for selfish or party ends, and the groundlessness of the allegations against him was ultimately fully confessed by even his accusers. Edward III. died in 1377, and was succeeded by Richard II. One of the first acts of Richard's reign was to reinstate Wykeham fully in his reputation and state. After Richard attained his majority, he in 1389 pressed Wykeham to again take upon himself the Chancellorship, and Wykeham accepted the Great Seal once more, though reluctantly, and held office for two years and three months, when he again resigned it, owing to the pressure of his ecclesiastical duties. He took no part in the unhappy events of the last year of Richard's reign. As a statesman, he was pre-eminently wise and astute, and while he was at the helm of State things went on very well, troublous as were the times. After his resignation of the Chancellorship he devoted his attention to the affairs of his see, expending enormous sums in restoring and rebuilding churches, monasteries, and hospitals. He was zealous and faithful in the discharge of his episcopal duties, and a determined enemy to the existence of all abuses. It had been objected by some writers that Wykeham was to be condemned as a pluralist, but Mr. Mallett contended that the exigencies of the times, the dearth of clergy, &c., justified and even necessitated the system whereby one man held a plurality of livings; at any rate, Wykeham was prompted by no sordid motive, and lavished his wealth on such good objects as church restoration and the founding of colleges. He rather sought to keep in good repair existing churches and cathedrals than to build new ones, seeing that in his time there was a great dearth of clergy (nine-tenths of them having been carried off by a succession of plagues); moreover, great masses of the population were carried off by plague, so that many and many a church was closed for lack of worshippers. New monasteries and convents Wykeham had no wish to endow; they were more than sufficiently numerous, and had not this been the case, he would most probably not have sought to perpetrate or extend a system into which he had abundant reason to know corruption had penetrated and held sway. There was, however, one great need which the people had, and that was counsel and advice, spiritual pastors and teachers. He therefore devised a scheme for the education of those who would devote themselves to clerical duties. In 1373 he partly established the School of St. Mary at Winchester, as an experiment, intending it to serve as a sort of nursery to the college he afterwards founded at Oxford. The carrying out of his plans was delayed, however, by the courtly intrigues already referred to. In 1379 the purchase of land for the site of his college at Oxford was completed, and in 1380 the foundation-stone was laid. (This college is now known as New College.) When he had completed the College at Oxford he set to work to finish the foundation at Winchester. Mr. Mallett's monograph then went on to describe the buildings at Winchester and Oxford, directing attention to the wonderful gradation in ornamentation which they exhibit, from absolute plainness in the offices to delicacy in the residential part and extreme richness in the chapels, for which alone is reserved all the best ornamentation. No sooner had Wykeham completed his colleges than (in 1395) he undertook the stupendous work of rebuilding the nave of Winchester Cathedral, at the time an old Norman building, erected by Bishop Walklyn (portions of whose works stand to this day) in 1090. Wykeham made an agreement with the Abbot of Quarre Abbey, Isle of Wight, for a supply of stone, and appointed William Winford architect, and Simon Membury surveyor. In Mr. Mallett's opinion, Winford was engaged in the capacity of draughtsman, and Membury as clerk of the works or foreman. Wykeham himself had ever been accredited with the design, and there could be little doubt that he, and not Winford, was its author, especially as it appeared to be but the carrying out (with altered details) of a design long before devised by Wykeham for the same work. Moreover, there was a striking resemblance between this and his other existing works. In rebuilding the nave Wykeham took the

opportunity of erecting his own shrine between the fourth and fifth piers on the south side—a spot hallowed to him by early associations. He did not seem to have been a successful designer of iron work, the hinges, &c., throughout the buildings erected by him being simply bands of iron, without ornament of any kind, the only exceptions to this rule being the great west door of the cathedral and the door of his shrine, where some slight configuration was attempted. For ten years the work at Winchester Cathedral was carried on, and it was scarcely completed when the munificent and benevolent prelate was called away to his rest. He died September 27, 1404, aged 80 years. He acted fully up to the spirit of his motto "Manners makyth man"—the word "manners" comprising much more than the etiquette of society—viz., integrity, rectitude, and moral worth. He was imbued with a deeply devotional spirit, coupled with the most untiring industry. He was great in all his three avocations—great as an architect, great as a statesman, and great as a prelate—widely different as were the qualifications for success in those different pursuits. His life was fraught with most valuable lessons, and "he was a man, take him for all in all, we shall not look upon his like again."

A MEMBER proposed a vote of thanks to Mr. Mallett for the admirable way in which he had treated his subject.

MR. MUNDEY, in seconding the proposition, said that history and architecture were so closely allied that to try to study the latter without the former was virtually impossible, whilst to attempt to study the former without the latter was to cast aside one of the most valued aids that was at hand. To the truth of this the life of Wykeham was a very strong witness, for whilst he had left behind him buildings which every lover of architecture would acknowledge to be noble and grand, in addition to that he took his place in the front ranks as a statesman and as a churchman, for as Lord Chancellor of England and Lord Bishop of Winchester he took a leading part in both the political and ecclesiastical history of his times, so that in his case history and architecture, which ever went hand-in-hand, seemed to come into closer communion than ever. Mr. Mallett had referred to Wykeham's re-appointment under Richard II., and he (the speaker) would just refer again to the circumstances connected therewith, because there were some important inferences to be drawn from them. It should be borne in mind that just before Wykeham's re-appointment by Richard he had been appointed as a member of a Parliamentary Commission, the distinct object of which was to limit the power of the young king, and, in fact, to take the reins of government out of his hands. It was a strong testimony in favour of Wykeham's character that directly the king regained his power he restored Wykeham to the chief office of the state. On the other hand, the appointment of Wykeham on the Commission justified the high regard in which he was held by both Parliament and people.

MR. RHODES having spoken in support of the proposition,

MR. CLARKSON remarked that Mr. Mallett did not state the extent to which the supervision of the details of his buildings was carried out by Wykeham himself. There was no doubt that the buildings under the direction of a man of Wykeham's power of mind would owe their main features to him; but it would be interesting to know how far the minute portions of the buildings that he superintended were influenced and were similar in character. Judging from the ironwork at Winchester, he was hardly inclined to allow that Wykeham's influence was carried to the extreme minuteness attributed to it by some people. In point of fact, he conceived that Wykeham's supervision of the minute details of his work was not by any means exactly what a modern architect was in the habit of affording. In conclusion, he suggested that Mr. Mallett's essay (or a copy of it) should be placed in the library of the Association for future reference.

MR. RIDDETT (a past Librarian) stated that most of the prize essays of past sessions were to be found in the library, either in MS. or in the columns of the professional periodicals. He had great pleasure in supporting the vote of thanks, especially as Mr. Mallett's was the prize essay out of five or six—a larger number than were usually sent in.

MR. C. H. F. LEWES said he believed that a paper on the same subject was read some few years ago by Mr. Papworth, who attempted to prove that William of Wykeham was not an architect at all, but merely a rich man who found the money for the erection or completion of the various buildings with which his name was connected.

The CHAIRMAN said there were few men of whom we had a better historical account than William of Wykeham, and the buildings erected in his time

being most numerous and in the best preservation, there was plenty of opportunity of examining their various details. He considered Mr. Clarkson's remarks to be well worthy of attention, but he could not conceive that Wykeham's name could be associated with so many buildings as it was unless he (Wykeham) had some share in their design. Wykeham lived in the early part of the Rectilinear period, and very probably a great deal of the work of that period belonged to him. He (the Chairman) had not heard of Mr. Papworth's theory, referred to by Mr. Lewes; but of course it could not be reconciled with Mr. Mallett's monograph of Wykeham. The moral of Wykeham's life, as revealed in history, was that if people, whether architects or not, would succeed in life, they must combine integrity with earnestness. The President then put the vote of thanks, which was carried with great applause.

MR. MALLETT, in reply, thanked the meeting for its appreciation of his essay. He quite agreed with what Mr. Munday had said. As to the details of Wykeham's works, referred to by Mr. Clarkson, it was very difficult to say what Wykeham actually did in any of his works, in all of which, however, there was a very marked likeness. His mouldings had a peculiar angularity, and all his windows had a splay with a peculiar channel sunk into it; his tracery, also, was very peculiar. He fully believed that William of Wykeham was an architect from the very day he left school, and that the work at the Castle of Winchester was his first work, and, moreover, the work which first gained him his reputation.

The CHAIRMAN announced that at the next meeting, to be held on Friday, December 1st, a paper would be read by Wyke Bayliss, Esq., F.S.A., "On the Three Schools; or the Distinctive Aims of Classic, Mediæval, and Modern Art."

OXFORD ARCHITECTURAL AND HISTORICAL SOCIETY.

THE annual meeting of this society was held in the upper room of the Ashmolean Museum on Wednesday week. The following gentlemen were elected officers of the society for the ensuing year:—President, the Rev. the President of Trinity; Honorary Secretaries, the Rev. J. S. Treacher, M.A., and Mr. J. P. Earwaker; Librarian, Mr. E. G. Bruton; Treasurer, Mr. James Parker; Auditors, the Rev. S. Edwardes and G. Ward, Esq.; Committee, Professor Westwood, Professor Stubbs, Professor Burrows, the Rev. W. Jackson, the Rev. C. W. Boase, the Rev. W. E. Daniel, and G. T. Pilcher, G. H. Morrell, G. W. Waters, and W. Nanson, Esqrs. Mr. James Parker said he had two letters to read to the society. One was in connection with No. 9 of the society's series of excursions last year, from the Rev. W. H. Price, of Somerton Rectory, Deddington, saying that he had enclosed a statement of what was suggested with regard to the restoration of an old cross in that place, and that they would be glad of any contributions towards the same; also, that they would be glad to receive any suggestions respecting its restoration. The statement alluded to showed that estimates had been obtained from three experienced men for the entire enlargement of the basement of the cross in cement, each old stone to be replaced in its original position, the void places to be filled up with corresponding new stone, and the shaft to be strengthened with cement and cramps. The estimated expense of the work was £10. The other was from Mr. H. W. Westropp, of Ventnor, Isle of Wight, enclosing a sketch of a small lighthouse on S. Catherine's Down, about seven miles from Ventnor. The writer stated that he believed it to be a *fanal* or *lanterne des morts*, as it was built in connection with a sepulchral chapel. The *fanal* and chapel were said to have been erected in 1323 by Walter de Godyton, who added an endowment for a priest to sing masses for his soul and the souls of his ancestors. On the east side can be seen where it was connected with the sepulchral chapel, which seemed to have a kind of resemblance to the tower and chapel at Clonmacnoise. It also faces the four cardinal points. All this seemed to bear out his view of the connection between the *fanal* and the round towers of Ireland. With regard to the cross at Deddington, mentioned in the first letter, Mr. Parker said that it was in a very unsatisfactory state, and that a few pounds would prevent the cross from disappearing altogether. The chairman said that that was a subject to be considered by the committee, and not at the general meeting, and asked if the society had made any grants toward anything of that kind. Mr. James Parker said that they had not during his term of office as treasurer. The Chairman expressed an opinion that the committee ought to do nothing more than acknowledge the receipt of the letter. The other question mentioned in the second letter

was one of considerable interest. The round towers of Ireland he had no doubt were to a certain extent lighthouses, as well as places where the monks used to resort to. He thought the lantern on S. Catherine's Down was used as a lighthouse. Mr. J. H. Parker said he did not see much resemblance between the round towers of Ireland and the lantern on S. Catherine's Down. Those of the former place were about 100ft. high. Both, however, stood in burial grounds. Mr. James Parker said that some six or seven years ago he was at the latter place, and he saw no signs of any burial ground there. He was of opinion, however, that it was a lighthouse. There were several lighthouses and chapels on the coast. Mr. J. H. Parker addressed the meeting on the desirability of a royal commission being appointed for the purpose of ascertaining the present condition of those important monuments of antiquity which, if destroyed, could not be replaced; and also the most effectual means of preserving them from further decay and injury.

MILANESE FURNITURE AND BUILDING MATERIALS.

THE following particulars of the Milan Exhibition are from an account forwarded to the *Society of Arts Journal* by an occasional correspondent:—

The exhibition was opened, with little ceremony, on the 2nd September, and was closed on the 2nd October.

The exhibition building consists of the "Salone del Giardino," which was completely restored last year, and admirably adapted for the purpose for which it is intended, namely, for holding exhibitions and concerts. This building is surrounded by four annexes, constructed roughly, but tastefully, in wood, the entrance from the Via Palestro representing a Swiss chalet. The total area of the exhibition is upwards of 8,000 square metres, and the number of exhibitors considerably exceeded 1,200.

Commencing the description of the exhibits in regular order, the first class to be noticed is that allotted to "materials for construction," and the various productions belonging to it, which are exceedingly plentiful in Italy, and are well represented.

Signor Galletti, of Bergamo, gives some idea of the richness of his province, in a collection of 164 different samples of marble, varying in colour from the pure white, from the quarries of Vezia, to the black of Gazzaniga, and the streaked to the rich variegated specimens from other quarries.

An industry which is worthy of more special attention than it has hitherto received is that of the production of artificial marble, and in which, during the last century, the Prince Sanseverino of Naples acquired a well-merited reputation, imitating the celebrated marbles of the East. In this art, Sig. Campana is most proficient, and at his manufactory at Naples he is able to counterfeit, not only the most precious of the antique marbles, such as the *rono antico*, the *verde antico*, but also the green and red porphyry, malachite, &c. Chicaglia, of Rome, and Gianoli, of Florence, also exhibit artificial marble, but their products cannot compete with those of Campana.

A variety of sandstone, of exceedingly fine grain, is a speciality of the province of Bergamo, and, made into grindstones, is exported in considerable quantity. The number of quarries worked is 36, giving employment to upwards of 1,300 persons, and producing 1,400,000 grindstones annually. The best-known quarries are those of Nembro and of Pradalunga, from which samples are shown by Sigs. Taddei and Piccinini.

The manufacture of hydraulic limes and cement in Italy is most important, and, although it is but poorly represented at the exhibition, it should not be passed over without remark. Hydraulic cement is comparatively a new product in this country, as Pozzolana has hitherto been almost exclusively employed in the preparation of mortars to resist the action of water. In 1846 the rich deposits of marly limestone existing in northern Lombardy were first brought into public notice by the Society of Encouragement of Milan; but it was not until 1858 that the lime and cement works at Serra Valle, in the Venetian provinces, and at Palazzuolo, near Brescia, were established. These works, now the property of the Alta Italia Railway Company, are the most important in Italy. In 1864, a company was formed at Bergamo for the manufacture of hydraulic lime and cement, and in the short space of six years the "Società Bergamasca" has attained considerable importance. Large quantities of this lime and cement have been employed in most of the public works that have been recently carried out in Italy. Amongst the most important may be mentioned the Canal Cavour, the port of Ancona, the

Victor Emmanuel Gallery at Milan, the bridge over the Adda, at Rivolta, built entirely of concrete, with the exception of the facings of the piers, which were of stone. The new sewers at Milan are being constructed entirely with concrete made with this cement.

The lighter coloured beds produce the slow-setting cements and lime, which is best adapted for concrete blocks of large dimensions, whilst those of darker colour, containing a larger proportion of clay, furnish the quick-setting cement, which, if not as quick-setting as the Roman and Portland cement, are still of excellent quality, and are produced at about one quarter the price. These works, which employ about 300 workmen, produce annually 6,000 tons of hydraulic lime and 10,000 tons of cement.

Among the various applications of the Bergamo cement exhibited are, an arch of eight metres span, built entirely of concrete; a bath, pipes, and a short length of the sewer recently constructed under the Via Carlo Alberto, at Milan. The Alta Italia Railway Company does not show such a complete collection of various applications of lime and cement as the former company, and have contributed only a large block of concrete, made with the lime of Palazzo. Concrete blocks, or *prismi*, are extensively used in Northern Italy as a substitute for stone in river embankment works.

One of the best limes in Italy is that of Casale. It is being principally used by the contractors for the important branch canal of the Canal Cavour, now in course of construction between the Ticino and the Agogna, for the irrigation of the Lomellina.

The specimens of asphalt, and pavements in this material, are numerous; and now that asphalt is likely to come into more general favour in England, it is probable that some of the rich deposits which are abundantly met with in Central Italy, and which hitherto have remained unworked, will be turned to profitable account. Amongst the principal exhibitors of this substance are the "Società Generale degli Asfalti," of Rome, Praga, and Erba, both of Milan. The last-named exhibitor has discovered a process by means of which he is able to colour both asphalt and lava, and to produce, at very reasonable prices, pavements of any design and colour. This material is unaffected by the heat of the sun, and has no unpleasant smell. The price of these pavements varies from 2fr. 50c. to 4fr. per square metre, according to the pattern required.

The fire-bricks and articles in fire-clay, exhibited by Ginori and Richard, and the crucibles of Bondi, of Rome, will bear comparison with those of English make. With regard to "timber for construction," which enters into the second section of Class I., we have but little to say, as the show is poor in the extreme, and gives no idea of the resources of the provinces of Piedmont, Lombardy, and Venice, which furnish excellent timber for ship-building and other purposes. Timber is also plentiful in Sardinia; and the larch from that island is remarkable by its absence.

The parquet floors are in great variety in the exhibition, and many of them are exceedingly beautiful and accurately made. Amongst the most worthy of note may be mentioned those of Pedotti & Co., of Milan.

A large model of the horse-tramway which is to be made from Milan to Monza is exhibited; but we think that Signor Lué, the inventor, has not hit upon the right form of rail for the purpose, and that the company are decidedly wrong in adopting this principle. The question of horse tramways in Italy is one of the greatest importance for that country, and one which the Government would be wise if they looked into. As yet, the few lines that have been made have turned out failures, and unless some really good system be adopted, they will never be looked upon favourably by the public.

In this class, Signor Donati, engineer to the company for the cleaning out of the cesspools in Milan, exhibits the apparatus for this purpose, amongst which is an ingenious arrangement for creating a vacuum in the cylindrical tanks, by the revolution of the wheels of the cart on which it is supported.

Terra-cotta forms an important branch of industry in Italy, and particularly at Milan, as the number of exhibitors from that city testifies. The statues and architectural ornaments shown by Boni and Ajzaghi, of Milan, have some artistic merit. We were greatly struck with two groups of figures by Boni, and a chimney-piece and cornice for a mirror by Ajzaghi.

Cheap, solid earthenware and stoneware has numerous exhibitors, amongst whom may be mentioned Dossena, of Lodi, and Legnani, of Cassano d'Adda, who furnish a quality of ware admirably adapted for cooking utensils, which, from its lowness of

price, cleanliness, and capability of resisting heat will no doubt find a ready sale amongst the poorer classes.

The imitations of Etruscan ware and *faience* of Giustiniani, of Naples, as also the exquisite vases designed by Professor Farina, in the Quattro and Cinque Cento style, are most creditable productions of the potter's art. The chief attraction, however, in this class are the exhibits of Ginori and Richard. As long ago as 1735, a manufactory was established at Daccio, near Florence, by the ancestors of the present Marquis Ginori for the production of imitations of Chinese porcelain, and, in spite of the difficulties which were met with at first, the Daccio manufactory is now most flourishing, and its productions find a very ready sale throughout the world. Besides a good collection of porcelain for domestic use, the Marquis Ginori exhibits a magnificent dessert service and numerous vases, which for richness and elegance of design leave nothing to be desired. The statuettes in "biscuit" show that there is no lack of artistic resource, and that the reputation of the old Italian pottery is worthily sustained. Whilst the porcelain of the Marquis Ginori has more of an artistic character, that exhibited by Sig. Richard, of Milan, presents altogether a commercial appearance. Not that we intend to detract anything from the merits of the latter, but it must be borne in mind that the class of ware manufactured by Ginori is intended more for the amateur than for the general public. Sig. Richard has introduced into his manufactory improved machinery, and, although both the workmanship and design do not want in elegance, yet he is able to produce ware which, for lowness of price, will compete with any other manufacturer.

Sig. Spreafico, of Milan, exhibits some very beautiful specimens of painting and decoration upon porcelain and glass. The decorations in white and coloured enamels upon glass, which are a *specialité* of this exhibitor, are produced at reasonable prices.

The art of glass-making is, as usual, represented by Dr. Salvati, whose productions are now so well known in England that they require no comment. The fine chandeliers of the old type, and the mirrors "Specchi," ornamented with wreaths and flowers, are most beautiful.

The exhibition of furniture in Class IV. is, on the whole, a most unsatisfactory one, as but few exhibitors seem to have thought it worth while to contribute cheap articles of common use. The majority of exhibits in this class is composed of fancy and expensive furniture. This is a great mistake, and one that is usually fallen into at exhibitions, where we see rather too few national and ordinary pieces of good furniture, and too much that is made specially as exhibition work.

Monti, of Milan, is an honourable exception to this rule, and shows a good collection of cheap wood furniture, made principally in the communes of Treccate, Canthi, Seregno, Cesano, and other villages of the Brianza, where the peasantry profitably employ their spare time in producing articles of furniture which find a ready sale in Milan.

The chairs of Chiavari are also a production of the peasantry in that neighbourhood, and from their elegance, lightness, and cheapness are exported in large quantities to France, England, and South America.

The use of iron for furniture is becoming more generally appreciated in Italy than formerly. Among the principal exhibitors may be mentioned Cambiaggio, of Genoa, Francisco Carbone, of Milan, who exhibits not only bedsteads and other household furniture, but garden chairs, &c.

Milan has, from the middle ages, been celebrated for her fancy furniture, marqueterie work, and wood carving, and at one time the Milanese workshops were real art schools, in which the workman acquired a real artistic feeling. The invasion of the French fashion, and the prevailing idea that everything that was good and beautiful must come from abroad, have done a great deal of harm to this trade. The class of furniture especially affected by the Milanese cabinet makers is that in carved ebony inlaid with ivory.

Carlo Corbetta exhibits a cabinet in the style of the fourteenth century; it is small, but quiet and judicious in design, tone, and execution; it is in ebony, with ivory and silver inlay. A large cabinet in ebony and ivory, by Mauprivez, may be examined as one of the best in the exhibition.

The Tuscan cabinet work is exhibited to great advantage, and a number of carved pieces, friezes, and frames, and including furniture of various kinds, are worthy of careful examination; nothing in the whole exhibition is more delicate than the bas-reliefs in walnut, representing Bacchus and Ariadne, by Rinaldo Barbetta, of Florence. The light-coloured marqueterie tables of Corridi are also worthy of note.

The only exhibits from the Neapolitan province in this class is the Serrento work, which is a most lively and characteristic description of wood mosaic, something similar to our Tunbridge ware.

COMPETITIONS.

ASHTON ON MERSEY.—At a meeting of the building committee appointed to superintend the erection of a new church at Ashton on Mersey, held on Saturday week, the design bearing the motto "Toujours pret" was selected. The design, which is that of Messrs. William Wilson & Oldham, of 23, John Dalton-street, Manchester, is of an Early style of architecture. The church will accommodate 650 persons, and has a wide nave with north and south transepts and chancel, and on the north side of, but opening from and on a level with the chancel and nave, is the organ chamber. The vestry is on the south side, and forms the lower portion of a tower, terminating in a spire. The nave is roofed by a single span, and, there being no columns, there is no impediment to either sound or sight. The cost of the church is estimated at £6,000. The premium of £50 for the second-best design was awarded to Messrs. Magnall & Littlewood, architects, Manchester. The competition was limited.

BRADFORD.—The plans for the proposed new Grammar School, furnished by the nine architects who had been invited to compete for the premiums, were exhibited in the old grammar school on Saturday. The Governors agreed to accept the plans of Messrs. Andrews & Pepper, provided all the conditions which they imposed can be carried out. The style of architecture of the design of Messrs. Andrews & Pepper is Gothic of the Perpendicular order. The school buildings will contain a good-sized entrance-hall and commodious staircase to the upper floors, also robing and retiring rooms for tutors, and private accommodation for them. There will also be a lavatory, a cloak-room for scholars, a large hall 60ft. by 36ft., capable of accommodating 250 boys and 100 visitors. On the same floor there will be five large class-rooms placed so that they cannot disturb the main hall. These will be larger than is usually allowed. The laboratory, scientific room, and special class-rooms will be on what might be termed the basement floor. This floor, however, will be out of the ground, and abundantly lighted and ventilated. There will also be a dining-room for the scholars, with a kitchen attached. On the upper floor there will be a drawing-room for the head master. The second premium of £25 was awarded Mr. George Ogden, architect, Exchange-passage, and the plans which took the third of £15, were by Messrs. Healey. Amongst the other architects who competed were Messrs. Lockwood & Mawson, Messrs. Milnes & France, and Mr. S. Jackson.

GATESHEAD SCHOOL BOARD COMPETITION.—At a special general meeting of the Gateshead School Board on Friday last, the 17th inst. for the purpose of finally deciding on architects' plans for the five groups of schools proposed to be built under the direction of the Board, the Designs Selection Committee reported that after due examination of all the plans they had made the following selection:—Group No. 1: Plan No. 14, Thomas Oliver, Newcastle; No. 19, John Sidebotham, Southport; Nos. 21 to 24, G. H. Thomas, Liverpool; Nos. 25 and 26, John Johnstone, Newcastle; Nos. 39 to 44, Ross and Lamb, Darlington. Group No. 2: Plan No. 41, Thomas Oliver; Nos. 55 to 56, John Johnstone; No. 72, Perkins & Sons, Leeds; No. 86, E. A. Heffer, Liverpool; Nos. 96 to 99, Parsons & Ellwood, Newcastle. Group No. 3: Plans 120 and 121, T. T. Smith, London; No. 129, Thomas Oliver; Nos. 131 to 133, Ross & Lamb; No. 134, E. A. Heffer; 137 to 139, John Johnstone; Nos. 143 and 144, Matthew Thompson, Newcastle; Nos. 145 to 147, A. E. Gough & Hudden, London. Group No. 4: Plans Nos. 149 and 150, John Johnstone; No. 155, Thos. Oliver; Nos. 169 to 171, T. T. Smith. Group No. 5: Plans Nos. 25 and 26, John Johnstone; No. 196, Thomas Oliver; No. 200, Henman, Alexander, & Henman, Stockton; No. 201, Perkin & Sons; Nos. 204 and 205, Ross & Lamb; Nos. 220 to 225, Robt. Fairbairn. Under the terms of competition the School Board are not bound to accept or adopt any design, but if a design for any group should be adopted by the Board, it is intended to employ the architect of the adopted design as architect for that particular group. The committee are of opinion that any design which may be adopted for any group will require modification and alteration, and they advise that in making the ultimate selection in each group this stipulation be definitely kept in view. Having re-examined the selected designs in detail, they recommended the following designs to be adopted by the Board:—Group No. 1, plan No. 14, Thomas Oliver; group

No. 2, plan No. 48, Thomas Oliver; group No. 3, plans No. 131 to 133, Ross & Lamb; group No. 4, plan No. 155, Thomas Oliver; and group No. 5, plan No. 196, Thomas Oliver. The report was unanimously adopted.

ARCHÆOLOGICAL.

DISCOVERY OF ANCIENT REMAINS IN THE ISLE OF THANET.—Whilst the workmen were engaged on the excavations for the stables of the Granville Hotel, they fell in with a portion of a Roman camp. Immense quantities of human remains were found; also an extensive pavement formed of bowlers of an enormous size, such as are not found at present on the south-east coast. Some fragments of pottery, both Etruscan and Roman, are exceedingly beautiful in form and workmanship. One jar is quite perfect, and is 2ft. in height. Boars must have been plentiful, as tusks were found by the dozen. Amongst the metal remains were two very fine nails with large conical heads, and an iron knife.

THE SERPENT MOUND AT LOCHNELL.—Mr. John S. Phené, F.G.S., F.R.G.S., the discoverer of the serpent and saurian mounds in Great Britain, which mounds are identical with those of Ohio and Wisconsin, and who has been for a considerable time engaged in opening *tumuli* in Scotland for the Duke of Argyll, the Marquis of Lothian, and others, is at present, in company with an eminent civil engineer in Glasgow and his staff, engaged in again visiting the great saurian mound on an estate near Oban—with the object of making cross sections of the structure, and making a more minute survey of its details. It is intended to construct a perfect model of this ancient structure, which is clearly a relic of serpent worship. When the model is completed, Mr. Phené intends to present a cast of it to the town of Oban.

Building Intelligence.

CHURCHES AND CHAPELS.

AMOTHERBY.—On Wednesday week the ancient church at Amotherby, York, was re-opened for divine service by the Archbishop of York, after restoration by Mr. Fowler Jones, architect, of York. The builder is Mr. Wm. Hodgson, of Malton. The church abounds in carving, both in wood and stone, the whole of which has been executed by the vicar. The new church—for excepting the tower and the south wall of the nave nothing of the old church remains—consists of nave and chancel and north aisles, the north wall of the nave having been put upon four Norman arches. The eastern window is of three pointed lights, inserted beneath a large Norman arch, springing from columns of Kilkenny marble. The lights are filled with painted glass, the centre having a representation of "The Crucifixion." The painting was mainly done by the vicar, with a little assistance in one light by an amateur friend, Mr. Kershaw, of Southam, Warwick. The nave and north aisle are seated with deal benches, every bench end being carved by the vicar, a cross and a foliated pattern, all varied, alternately.

BRADFORD.—The foundation-stone of the new church of S. John, Bradford, was laid on Saturday by the Bishop of Ripon. The church, which has been designed by Messrs. T. H. & F. Healey, architects, Bradford, will cost over £7,000. It is in the English Gothic style, 125ft. long, 50ft. wide and 50ft. in height. The principal feature of the edifice is a tower 23ft. square at the base, and which will rise to a height of 109ft. above the ground. Externally built of stone, the interior walls will be finished with pressed brick, relieved with bands of ashlar and black bricks. The seats are to be of pitch pine, and the stalls, the chancel fittings, and the doors of oak. Accommodation will be found for 700 persons. The works have been let to local contractors.

CLIFTON.—The (Roman) Catholic Church of S. Mary, Clifton, was reopened on Monday last. The alterations effected in the church have been executed under the superintendence of Mr. C. Hansom, of Clifton. An organ gallery has been built in the left wing. Four confessionals have been built on the west side of the chapel, the sanctuary has been enlarged, and a reredos and a high altar placed therein. From the centre of the reredos, which is carved in Bath stone, rises a dome, for the receptacle of the monstrance. A reredos has also been supplied to the Lady chapel, and has in its centre a niche containing a statue of the Virgin bearing the infant Jesus. At each corner of the whole piece is the figure of an angel bending in adoration. The ceiling of the church has been renovated, and with the cornice is decorated.

COGGS.—The chancel of this parish church was re-opened by the Bishop of Oxford on the 14th inst. Although the church is a very small one (accommodating about 100 persons), the level of the piscina proves the original altar to have been raised considerably above the nave floor. Seven steps are now provided from the nave level leading up to the altar, and it is possible that originally there were as many as eight, or, what is more probable, that there were seven, with a rise of 7in. each. Before the restoration, several ordinary square pews occupied the chancel, arranged so that the occupants faced west. All these pews are turned out into a side chapel, and new fittings (providing accommodation for a surpliced choir) take their place. The work has been carried out by Messrs. Groves & Cantwell, from the designs of Mr. Clapton Rolfe.

CREWE.—A new cemetery was consecrated at Crewe on Saturday week. The chapels are Gothic, built of red and blue brickwork, with stone porch, windows, and dressings. Accommodation is made for seating about fifty persons in each chapel. There will be ornamental gates and palisading at the entrance to the cemetery. The whole has been designed by, and executed under the superintendence of Mr. George Watson, surveyor. Mr. Cotterill is the contractor for the chapels, Mr. Heaton, of Warrington, for the roads and approaches, and Mr. Ellison for the boundary wall.

GATESHEAD.—Christ Church, Gateshead, was on Friday last formally opened for the performance of divine service. The total cost has been estimated at £6,000. The style adopted is Early English. The organ has been built by Mr. Postill, of York.

HOLMFIRTH.—The foundation-stone of a new chapel in connection with the United Methodist Free Church at Holmfirth, was laid on Saturday. The building, which is estimated to cost £750, is from a design made by Mr. Foster, of Snidley.

KILDARE.—Active steps are about to be taken for the restoration of Kildare Cathedral. Mr. Street is to be the architect. Only the chancel or choir, a very small modern building, retains its roof; but enough remains of the walls and foundations of the nave to guide the restorer. The church is cruciform, without aisles, and dates from the thirteenth century. It has a central tower, and near it stands one of the finest examples of the Irish round tower, about 130ft. in height. The buttresses and windows remain, and the south transept is almost perfect. Mr. Street proposes to re-roof and restore all this part, and afterwards to deal with the choir, which has not an old feature left. The scale of the church is very small in comparison with an English cathedral, but the central tower gives the design much of the character of a cathedral, and the whole is full of interest. Between the nave buttresses the space in front of the walls is spanned by pointed arches standing away from the walls. The reason for this is not apparent, but they look very much as if they were the handiwork of men engaged in military architecture, who, for the sake of picturesque effect, borrowed a feature from fortified buildings.

NUNEHAM PARK.—Colonel and Lady Susan Harcourt are about to build a new church for Nuneham. Mr. Clapton C. Rolfe, of Braintree, Essex, has been engaged to carry out the work.

ROCK FERRY.—The Congregational Church which has been erected at Rock Ferry was opened last week. The building is Gothic of the first half of the thirteenth century, and is built of white Stourton stone. It consists of a nave, 76ft. 9in. in length by 48ft. in width, with aisles and transepts, large apsidal class-rooms, vestries, and lecture-hall; and at the eastern end are a tower and spire which, when completed, will be 150 feet high. The building has been erected from designs by Mr. D. Walker, architect, Lord-street, the builders being Messrs. Booth & Richards, Rock Ferry. The total cost, including the price of the land, is £6,500.

RUNCORN.—S. John's Presbyterian Chapel, Runcorn, has been reopened after painting and alterations. The cost of the alterations has been £300, and the work has been executed by Mr. James Kirkham, of Runcorn, the contractor, under the superintendence and direction of Mr. Richard Owens, of Liverpool, the architect.

SHELDON.—The Bishop of Exeter reopened the recently-restored church at Sheldon in his diocese on Thursday week. The style of the old edifice was Early English. The structure consists of nave, chancel, south porch, and western tower. The church is built of a hard, grayish-coloured stone, relieved with Bath stone dressings. The roof is covered with slate, and the ridge is capped with red tiling. The fittings are of the plainest but most serviceable character. The total cost of the work

will be about £450. The architect is Mr. Hayward, of Exeter, but the works have been carried out under the superintendence of Mr. Henry Fowler, surveyor, of Honiton. The builder is Mr. Summerhayes, of Honiton.

S. JOHN THE EVANGELIST'S CHURCH, EAST WITTON, YORKSHIRE.—On the 1st inst. the above church was reopened for Divine service by the Bishop of Ripon, being thoroughly repaired and improved. The church was rebuilt in 1809 in the style of that period. It has now been remodelled to a considerable extent externally, and the interior quite changed by the removal of a west gallery, the pews, and three-decker pulpit, &c. Open seats of plain deal have been introduced, and the pulpit, desk, and chancel fittings of pitch pine inlaid with cedar. For the plaster ceilings boarded ones, with moulded ribs, have been substituted; those to nave and chancel are vaulted. The floors have been laid with Minton Taylor's tiles; the pillars and arches of aisle arcades and chancel, which were of rough stone, plastered, have been chiselled, and the capitals altered to bring them into better character. The windows and glazing are also remodelled, new doors and doorways lined with stone, the south porch raised and re-roofed, a small baptistry placed on the north side, with a new font, and an organ chamber constructed at the east end of the north aisle, with arched openings into aisle and chancel. The church has been efficiently warmed by a hot-air stove and chamber under the nave floor, with flue leading the warmed air into the chancel and aisles. A tile reredos has yet to be fixed under the east window, which is of five lights, and fitted with stained glass, given some years since by Lady Ailesbury, and who, with the daughter of the vicar, most tastefully decorated the chancel with cloth hangings, relieved by autumn leaves and flowers on the wall spaces intended for tile work. The altar rail is of brass, with iron and brass standards, by Messrs. Thomason, of Manchester, and the table-cover is of velvet, from Jones & Willis, of Birmingham. The work has been carried out under the superintendence of Mr. Fowler Jones, architect, of York, at the sole cost of the Marquis of Ailesbury. The vicar, the Rev. J. H. Pollexfen, with the assistance of the churchwardens and parishioners, has had the organ added to and improved by Messrs. Radcliffe & Sagar, of Leeds. The contractors were Messrs. Keswick & Roukledge, of York, and Mr. George Harrison acted as Clerk of the Works.

S. PATRICK'S ROMAN CATHOLIC CHURCH AND SCHOOLS, MILL STREET, HULL.—The above buildings were opened on November 8, by the Bishop of Beverley. The elevation towards Mill-street presents a two-storied building of six bays, with entrance and bell turret at west end, and shallow transeptal projection at east end. The lower tier of windows in school are square-headed single lights, with a triplet in the projection at east end. The windows in church above are a continuous arcade of deeply-recessed lancet lights, with a circular window in the gable of transept. The upper portion of the bell turret (which contains a cast steel bell by Vickers & Co.) is of pitch pine, with oak weather-boarded spire, surmounted by wrought iron finials and cresting, in all rising to a height of 70ft. above the pavement. The walls, window jambs and arches, and strings, &c., are built entirely of old pressed and moulded bricks. The school department on ground floor comprises an L-shaped girls' school, 80ft. × 18ft., and infants' school, 33ft. × 17ft. 7in., with the usual conveniences in the rear. The church, 70ft. × 36ft., has an open timber roof of good pitch, giving a clear height of 32ft. to the collar level. The benches throughout are of pitch pine, with shaped and moulded ends. The altar rail, altar and reredos, are also of pitch pine of very carefully selected figure, with tile and marble panels, the upper portion of reredos being occupied by a large picture of the "Adoration of the Magi." The ceilings and lower portion of walls of the schools and church are boarded. The whole of the exposed woodwork is very lightly stained and varnished. The cost, including school fittings, will be rather over £1,900. The works have been carried out by Messrs. Hockney & Higgins, from the designs and under the superintendence of Mr. Edward Simpson, architect, of Tyndal-chambers, Tyndal-street, Bradford.

SOUTHEIGH.—The old parish church of Southleigh, in which John Wesley preached his first sermon, is to be restored very shortly. Mr. Ewan Christian, on behalf of the Ecclesiastical Commissioners, undertakes the chancel, and Mr. Clapton C. Rolfe the remaining portions of the building.

STONE.—A new Congregational Chapel was opened at Stone, Staffordshire, on Monday week. Mr. Geo. Bidlake, of Wolverhampton, was the architect, and Mr. Nelson, of Dudley, the builder. The plan of the

chapel is a nave 63ft. long by 38ft. 6in. wide, with central entrance lobby and staircase wings, each with separate entrance. Behind the chapel, but connected therewith, are the school buildings, providing on the ground floor an infant school 27ft. by 14ft., four class-rooms, each about 10ft. by 10ft. and a room for the use of the deacons or for committees. The principal fronts are faced with Hollington stone laid in random work, with level beds. The style is Geometric Gothic. The principal front has a central gable, with a five-light tracery-headed window, under which is the main entrance to the ground floor. At the south-western angle rises a tower and spire to a height of 80ft., and at the south-eastern is an octagon-ended staircase wing. The western and eastern sides are divided into five bays by buttresses, having two tiers of windows. Internally the chapel is open-roofed, the ceiling being carried about half way up the rake, and then across at the collar. The accommodation is for nearly 700 worshippers. The cost of the buildings is about £3,700. The sub-contractors for the glazing are Messrs. Done & Davies; for the staining, &c., Messrs. Grant; for the gas fittings, Messrs. Thomason, of Birmingham and Manchester.

YORK.—St. Saviour's Church, York, was reopened on Tuesday last by the Archbishop of York. The roofs, which were stained very darkly, have been painted a light buff, ornamented with blue, crimson, and gold. The piers and arches of the arcades have been stripped of whitewash, the stone work redressed, and where necessary, repaired. The black boarding at the east end of the church has been taken down, opening out the lower mullions of the east window. The wall has been painted, and panels inserted in the lower interstices of the window.

BUILDINGS.

BRADFORD MODEL LODGING-HOUSES.—The new building erected in Wigan-street, Bradford, from the designs of Messrs. Andrews and Pepper, for the Model Lodging-House Company, is approaching completion, and will be ready for occupation early next year. The building is a long structure, four stories in height, lighted with windows on either side. In the centre of the building a house for the keeper is located, and right and left are staircases which afford communication to the various grades of lodgers. There are day rooms, lofty, well lighted, and amply ventilated; indeed, throughout the whole building great care has been exercised to have an abundance of air and light.

DERBY.—A building with an iron front has just been completed at Derby. The front of the structure, which has been raised for Messrs. J. & G. Haywood, ironfounders, &c., is entirely of iron, and has been manufactured by the firm. The designs for the building and the decorating and painting have been supplied by Owen Jones, Esq., of London. The decorations and painting which are admirably carried out, were intrusted to Messrs. Staton & Co., of Derby. A very large trade is being done at the Thorncliffe and Chapelton Ironworks, near Sheffield, in cast iron window and door heads, as well as in general castings of this class, which are now largely used in buildings.

DURHAM.—The new County Court Offices at Durham are now completed. The building is situated at the junction of the Baths Bridge-road and Old Elvet, and is in the Gothic style, after the manner of secular buildings on the Continent during the sixteenth century. It is built with Waskerley Fell natural coursed blockers, with dressings of Rainton Park stone. The building has been erected by Mr. R. Sanderson, builder, of Gillesgate, Durham, from the designs of Mr. T. C. Sorby, architect, of London, Mr. Robert Phillips acting as the clerk of the works.

LONDON.—The committee of the Congregational Memorial Hall Fund have now agreed on plans, prepared by Mr. John Tarring, architect, and the subscribers have approved of the designs. The building will occupy a large frontage in Farringdon-street, part of the site of the old Fleet Prison, and will have access also by Fleet-lane. The elevation is a combination of the Baronial with the Gothic, peculiar to the period of the Ejection, and will have a very striking and imposing appearance. The cost of the freehold is £28,000, and the hall and offices will not be built for less, but the building will be a great addition to that part of the City.

PARIS.—The subscription for the rebuilding of the Palace of the Legion of Honour continues to yield excellent results. The sum collected has been so considerable that the works have been undertaken on a large scale, more than a hundred men being employed. Should the weather prove favourable all the external work will be finished, it is expected, by

the 1st of next January, and the whole of the building be roofed in. The interior, which is already being actively proceeded with, will then be completed without any delay.

WALTON.—On Monday evening, a new school, erected in connection with S. Mary's Church, Walton-on-the-Hill, was formally opened. The school, which is built to accommodate 200 boys, consists of a schoolroom 80ft. long by 20ft. wide and 18ft. high, and two large class-rooms fitted with galleries. The style of architecture is Gothic, and assimilates to that of the church and the schools for infants and girls. Externally, the building is faced with gray brick, relieved by a few bands of red and black brick and red sandstone dressings, and is surmounted by a bell tower which rises to a height of 42ft. Mr. Heffer, 2, Dale-street, Liverpool, was the architect, and the works were carried out by Mr. Henry Hancock, of Walton-on-the-Hill, the contractor. Together with the fittings the school is expected to cost £1,250.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

The conclusion of Mr. Haywood's report on granite and asphalt pavements is again crowded out for want of space, together with other important and interesting matter.

Correspondence.

THE NEW LAW COURTS.

To the Editor of the BUILDING NEWS.

SIR,—Permit me to make a brief remark upon your engraving of the "Elevation of the West Part of the Strand Front" of the New Law Courts, published in your issue of last week.

The full effect of this part of the "Strand Front," which, in reality, is the south front of the main block of the building, and does not extend beyond it, either eastwards or westwards, in no slight degree depends upon its connection with the remaining portions of the design. Towards the east (that is, from the right of your engraving) the design for the entire Strand front is continued to form the south front of the great quadrangle, and of the range of building still further to the east, in which direction also is the clock-tower. Mr. Street's design, again, includes a west wing, the treatment of which (and especially when it is considered in connection with the eastern portions of the design) cannot fail to exercise a most important influence upon the architectural character of the entire Strand front as a single composition. In that part of the Strand front shown in your engraving, it will be kept in remembrance that the south end of the central hall is set back from the general line of the face of this front as much as 60 feet.—I am, &c.,

THE WRITER OF YOUR NOTICES OF THE
NEW LAW COURTS.

PLANNING HOUSES.

SIR,—No less than nine gentlemen last week commented on my letter of the 10th inst., most of whom approve of the propositions which I made, but the conclusion to which one must inevitably arrive is the utter impossibility to satisfy all. Allow me to analyse the remarks of one or two dissentients. "M," who has before now advocated the justness of anonymous authorship, protests against "the affectation of secrecy by putting mottoes" as being one of the "most ridiculous as well as vicious points in ordinary competitions."

What constitutes the difference between anonymous authorship of geometrical designs and written articles, so as to render one "ridiculous and vicious," and the other correct and virtuous, we fail to ascertain. Had that gentleman acted up to his opinions his argument would fall with greater weight. Possibly many practical architects would gladly assist in this movement, but who for perfectly legitimate reasons would object to the weight of their names placed in the balance. Perhaps the most impracticable proposition is that of making the competitors the umpires by

exhibiting the designs at the office of the BUILDING NEWS. Faucy the present writer having to travel more than two hundred miles to comment on the designs of others! The Editor of this paper will not allow this competition to be made a golden apple upon which some London clique might luxuriate; for in the matter of honest rivalry London already possesses far greater advantages than the country; though we confess those advantages are not made the most of. Remote provincial contributors should have equal footing and chances of success as those in London. Undoubtedly the most satisfactory method for adjudication is for the Editor and a couple of practical architects to decide upon the merits of each design.

"Reader" has endeavoured to throw cold water on the scheme by a contemptuous sneer at forgetfulness "to tender any pecuniary assistance towards getting the result of their hours of idleness before the public." We have no desire to inquire into the vague notions which "Reader" must possess as to "hours of idleness," but perhaps he would explain in what respect an attempt to improve the domestic architecture of this country, which sadly wants development, can be called idleness? We have of late heard much about "distrust of all architects," and in my opinion this distrust has been brought about not by erection of public schools, churches, town-halls, or the like, but principally by imperfect house building. People generally estimate the worth of architects by the buildings in which they live and frequent. "Reader" also speaks of the "presumptuousness of anticipating the wants of a client." Now, let us consider it from the standpoint of actual practice. There is a place in the west of England which may be termed "the City of Villas." These villas are mostly only a trifle smaller than some which have lately been illustrated in the BUILDING NEWS, and the entire arrangement of ninety-nine per cent. of those buildings have been left in the hands of the architects without control; the fact is, the architects have—so far as size and cost go—anticipated the client. Most of those houses are badly arranged, having no staircase light but a small hole over a tank! but they have fair exteriors. Again, I speak from my own practice, for I find that most clients have very vague notions as to what they really do want within limits of cost, and it is only upon seeing different plans that they decide. In fact, an architect is almost compelled to anticipate in a measure the wants of a client, and for this reason I have not the least doubt that the competition cannot fail to be of practical interest and value to the subscribers of the BUILDING NEWS. I have previously recommended the limit of area to (say) 5,000 superficial feet, because within that limit almost any usual want can be compressed, and because an extension of area implies also an increase of cost; but at the same time I think that plans of smaller dimensions should be none the less neglected, but valued according to their intrinsic merit, without relation to size, for, by so doing, the field of usefulness would be widened from the "rich merchant" to the simple well-to-do.—I am, &c., H.

CHURCH BELLS.

SIR,—No authority seems certain as to the exact date of the introduction of large bells into Christian churches, but the general opinion appears to be that they were invented by Paulinus, Bishop of Nola, a town near Naples, about the year 400, but their use was not general until about the sixth century. It is to be supposed that their introduction into Russia should date from the time of Vladimir's conversion, 988, though they were not universal, for we read of certain wooden, iron, or brass plates suspended in the entrances of churches, being beaten for the purpose of calling the faithful together to prayer. Even where there were real bells, they were only rung on Sundays and great feasts, and the plates made use of on week days. Little bells, however, were known in the time of Moses, B.C., 1491, as may be seen in Exodus, xxviii. 33-35, and in imitation of Aaron's robe, the Bishops of the Greco-Russian Church have little tinkling things on their capes and mantles to this day. They are mentioned also by Zechariah in the fourteenth chapter of his prophecy, twentieth verse, as attributes of war-horses.—I am, &c.,

A. E. N.

ARCHITECTS' OFFICE HOURS.

SIR,—The letter in your last week's issue signed "An Assistant" will be gladly welcomed by all assistants and pupils in the profession. What is called early closing in reality is not so, it being only the shortening of the already protracted hours of daily labour. When we take into consideration that the average office time of London architects is half-past 9 a.m. to 5.30 to 6 p.m., with an hour in the middle of the day, it will be seen that there is not much time to devote to morning or evening studies, more especially as in most

SOUTH EASTERN RAILWAY.—Additional metropolitan extensions are proposed by this company. Besides the alterations in connection with their property at Greenwich, having for their object the continuation of their line direct from Greenwich to Woolwich, the company has given notice of intended application to Parliament for power to make a railway 1040 yards in length at Greenwich, and also another line, 560 yards in length, forming a junction with the London, Chatham, and Dover Railway near Price-street, Southwark, passing thence through or into the parishes of Christ Church, Blackfriars and S. Saviour's, Southwark, and terminating by a junction with the Charing-cross line of the company near Great Guildford-street, Southwark, and to authorise running powers over a portion of the London, Chatham, and Dover and Metropolitan railways. By this proposed short line the South Eastern Company would have direct access to Ludgate-hill station and the proposed central station on Holborn Viaduct, besides their stations at Charing-cross and Cannon-street.

THE HOLBORN VALLEY IMPROVEMENTS.—At the last meeting of the Court of Common Council, the Improvements Committee sought authority to give the necessary notices, and generally to take such steps as may be expedient for prosecuting a bill in the ensuing session of Parliament for further powers in respect of the Holborn Valley improvements. Mr. Deputy Fry, in moving the adoption of the report, said the committee could not complete the Holborn Valley works without applying to Parliament for compulsory powers. He mentioned one or two things which showed the obstacles and difficulties in the way of their prosecuting this great work. In making the new street from Fleet-street to Holborn-circus, they came on the crown of two cellars. These cellars were in the garden of a house, and the parties objected to their being touched. They were told by their law officers that they had the power to touch them, and they were prepared to make the cellars more convenient to the parties than they were before. The parties applied to Parliament for an injunction, which they got, and stopped the work, and the street could not be brought up to the level they designed it should be, and they could only get into Bartlett's-buildings by the temporary arrangement they had made. Then there was a gentleman who wanted for a certain house three times its value, while another had asked £60,000 for a triangular piece of ground required for the formation of the street. The committee would not listen to it, and they had allowed the street to be formed with that projection, and that was an explanation why the street was imperfect. There were a few houses in Harp-alley (which was an awful neighbourhood before it was disturbed for these improvements) which they could not get without compulsory powers. There was another object in having these compulsory powers. The authorities of St. Sepulchre's Church entered into negotiations with the committee for opening up the western end of that fine church; they were willing and had the means to do this, but the law prevented them. The Holborn Valley improvements were not complete without accomplishing these objects. However, the new street from Holborn-circus to Fleet-street has been opened this week.

TREES IN CITIES.—Just take a turn through London (says the *Gardener's Magazine*) and note, where a few good trees remain, the delightful break they offer to the monotony of brick and stone and the rigid lines of roofs and walls. Look again at the vast spaces that are utterly treeless, and how strikingly the noblest architecture fails to produce its due impression, and how common-place edifices stare out upon one in forbidding forms that chill the marrow of a man of taste. It was one of the chief sources of the fascination of Paris that the open spaces were freely timbered. Alas! poor Paris! Perhaps when we next tread her once gay streets our attention may be directed to the spots where there were trees before the siege, and hear the story of their felling, as a small item in the anguish that was brought upon the devoted city.

PROPOSED NEW STREET AND RAILWAY THROUGH THE CITY.—Mr. Haywood, the engineer to the City Commissioners of Sewers, stated last week that he believed there was a project now afloat for a mid-London line of railway, which, approaching Christ's Hospital, Newgate-street, by way of the Holborn Viaduct, would take the line of the new street which was projected by him some years ago north of the Bank, right through the City, in connection with the new street formed a few years ago leading out of Whitechapel-road, and thus making a complete northern line of traffic through the City and between the east and west of the metropolis. The railway company proposed, under certain conditions, to form that street and a railway beneath it.

INCORPORATED SOCIETY FOR PROMOTING THE ENLARGEMENT, BUILDING, AND REPAIRING OF CHURCHES AND CHAPELS.—The usual monthly meetings of this society were resumed on Monday, at the society's house, 7, Whitehall. Grants of money were made in aid of the following objects, viz.:—Building new churches at Folkestone, S. Michael's, Kent; and Guernsey, S. Barnabas, in the parish of S. Peter Port. Rebuilding the churches at Gwynfe, in the parish of Llangadock, Cardigan, and Harbury, near Leamington. Enlarging or otherwise increasing the accommodation in the churches at Avenbury, near Bromyard; Boughton, near Stoke Ferry; Debenham, near Stonham; Ipswich, S. Mary Quay; Kingstone, near Newport, Isle of Wight; Newcastle, S. Anne's; Rochester, S. Margaret's; Rowington, near Warwick; Ryarsh, near Maidstone; Salmonby, near Horncastle; and Theltham, near Harling, Suffolk. Under urgent circumstances the grants formerly made towards building the church at

Traveller's Rest, in the parish of Swinbridge, near Barnstaple; rebuilding the church at Whitechurch, near Cardigan; and towards reseating and restoring the churches at Colchester, S. James; Littlebury, near Saffron Walden; and Lyonsshall, near Kingston, Hereford, were each increased. Grants were also made from the School Church and Mission House Fund towards building school or mission churches—at Hinkshay, in the parish of Dawley Magna, Salop; Leicester, S. Matthew's; Norland S. James, in the parish of Kensington, Middlesex; Pentre, in the parish of Flint; Red-street, in the parish of Chesterton, Staffs; Thorney Toll, in the parish of Guyhirn, near Wisbech; Tyldin Gwyn, in the parish of Festiniog; and Berwick-upon-Tweed. The society likewise accepted the trust of a sum of money as a repair fund for the church of S. Ambrose, Everton, near Liverpool.

DESTRUCTION OF Gobelins TAPESTRY.—The following is a list of the Gobelins tapestry burnt during the struggle between the Communists and the Army of Versailles, communicated by M. Campenon, Controller-General of that celebrated manufacture:—Ancient: "The History of St. Crépin;" "The Months of Lucas," fragment of the hanging called "Du Parnasse;" a piece of that called "The School of Athens;" a fragment of "The Triumph of the Gods;" and another of "The Wars of Alexander." Modern: "The Aurora of Guido," seen in the Exhibition of 1867; "The Assembly of the Gods," after Raphael; "The Assumption of the Virgin," after Titian; "Sacred and Profane Love;" "Air," a fragment of "The Elements," by Lebrun; "Elysium" (the Five Senses), after MM. Baudry and Dieterle; a tapestry after Boucher; besides some others. All these pieces are known to have been previously smeared with petroleum.

TUNNELLING THE SEVERN.—Two schemes are before the public for tunnelling the Severn, one having been brought forward by Mr. Fulton and the other by Mr. Richardson. Mr. Fulton proposes to burrow under the river near Lydney, while Mr. Richardson has selected a point known as New Passage as the scene of his contemplated operations. Mr. Leonard Bruton, late secretary of the Bristol and South Wales Union Railway, has announced that the directors of the Great Western Railway will support the New Passage scheme. The cost of the works, including approaches and branch lines, is estimated at about £750,000.

ENCROACHMENTS IN VICTORIA PARK.—Some discontent prevails in the districts of Mile-end, Bethnal-green, and South Hackney, owing to the announced intention of the Board of Works to take a large portion of Victoria Park, near the Royal Hotel, for house building. A committee is in course of formation for holding an indignation meeting at the East-end of London, to protest against the proposed encroachment. It is stated that the Rev. Septimus Hansard, of Bethnal-green, is actively moving in the matter in defence of the interests of the poor, and the question will also be taken up by the Public Rights Defence Association, one of whose objects is to maintain intact the public parks, gardens, and similar open spaces for the use and recreation of the people. There is a large and influential branch of this association at the East-end, by whom immediate action in the matter will be taken.

CHIPS.

The returns of the district surveyors appointed under the Metropolitan Building Act for the past year show that fees have been received in respect of 6138 new buildings, and 6563 additions, alterations, and other works. Total amount of fees received, £3,000 2s. 4d.

The new Dean of S. Paul's has subscribed £1,000 to the S. Paul's Completion Fund.

Messrs. Gray & Davison are rebuilding the organ of S. Clement's Church, Eastcheap.

Mr. Alderman Stone has been appointed by the Court of Common Council to succeed the present Lord Mayor (Mr. Alderman Gibbons) as a representative of the City at the Metropolitan Board of Works.

Stannington Church, Newcastle, was consecrated on the 31st ult. by the Bishop of Durham, after having been rebuilt from the plans of Mr. R. J. Johnson, architect, at a cost of £6,000.

The fine old Church of Alberbury, situated on the border of Wales, about nine miles from Shrewsbury, was reopened by the Bishop of Hereford on the 26th ult.

Mr. George Powell, of Nanteos, Cardiganshire, has presented a valuable collection of paintings and other works of art to the town of Aberystwith.

The Institute of Painters in Water-Colours has elected Mr. Walter May an Associate of their body.

The Society of Antiquaries held their first meeting for the session last evening at Somerset House. A paper was read on "Medieval Representations of Months and Seasons."

A merchant at Frankfort, who owned property in Chicago, has received a characteristic telegram from his American agent there. It is couched in the following laconic terms:—"All your houses are burnt to the ground. Reply by telegraph if I am to commence rebuilding at once."

The Bishop of Salisbury opened a new channel at Christ's Church, Warrminster, on the 9th instant. The building itself is of the style usually adopted some forty years ago, but the addition is by Mr. T. H. Wyatt, President of the Royal Institute of British Architects. It is proposed ere long to restore the older parts.

Timber Trade Review.

PRICES, November 20.—Lathwood, per cubic fathom: Petersburg, £6 10s. to £7 10s.; Riga, Dantzic, Memel, and Swedish £3 to £5.

Oak staves, per mille of pipe: Memel crown, £180 to £120; back, £150 to £160; Dantzic, Stettin, and Hambro', £130 to £180; Canadian standard pipe, £85 to £90; puncheon, per 1,200 pieces, £26 to £27; Bosnia single barrel, per 1,200 pieces, £26 to £27; United States pipe, £45 to £60; hoghead, heavy and extra, £35 to £45; slight ditto, £30 to £32.

Mahogany, per foot superficial: Honduras (cargo average), 5½d. to 6d.; Mexican, 5½d. to 6d.; Tabasco, 6d. to 6½d.; Cuba, 7d. to 10d.; curls, 16d. to 24d.; Cedar: Cuba, 6d. to 7½d.; Honduras, 5d. to 6½d.; pencil, 2d. to 4½d.; bird's-eye maple, 5½d. to 7d.; walnut Italian, 4½d. to 5d.; ditto Canadian, 2½d. to 3½d.

Timber, per load of 50 cubic feet: Riga, £3 5s. to £3 7s.; Dantzic and Memel crown, £4 to £4 10s.; best middling, £4 to £4 10s.; good middling and seconds, £3 to £3 5s.; common middling, £2 10s. to £2 14s.; undersized, £2 10s. to £2 15s.; small, short, and irregular, £2 to £2 10s.; Stettin, £2 10s. to £2 15s.; Swedish, £2 7s. to £2 13s.; ditto small, £2 to £2 4s.; Swedish and Norway balks, £1 18s. to £2 2s. 6d.; Indian teak, £12 10s. to £13 10s.; African oak, £23 10s. to £9 10s.; greenheart, £5 10s. to £6 10s.; Cuba Sabica, £8 to £9; iron bark, £6 to £6 10s.

Deals and battens per Petersburg standard hundred: Archangel yellow, £12 10s. to £14 10s.; Petersburg yellow, £12 10s. to £13 5s.; Wyburg yellow, £9 15s. to £10; Gelfe and best Swedish deals, £10 10s. to £12 15s.; Swedish battens, £7 10s. to £9 10s. Flooring boards, per square of lin.: First yellow, 9s. to 10s. 6d.; first white-wood, 8s. to 9s. 6d.; second qualities, 6s. to 8s. 6d.

Trade News.

TENDERS.

BARLSTON.—For the erection of stables, for J. W. Pankhurst, Esq. Messrs. Scrivener & Son, architects:—

Barlow £599 11 0
Cooke (accepted) 505 0 0

BRIXTON.—For roads and sewers on the Milkwood Estate. Messrs. W. G. Habershon & Pite, architects:—

Wilcox £2788
Thompson 2695
Taylor 2663
Elmore 2616
Pearson 2599
Young 2560
Goodair 2332
Haynes 2300
Mayo 2269
Clark 2222
Keeble 2158
Jarman 2057
Bloomfield 2048

CITY.—For alterations and additions, and new counting houses, to a warehouse, Wood-street, E.C. Mr. Herbert Ford, architect:—

Hill, Keddell, & Waldram £3500
Browne & Robinson 3180
Myers & Sons 3124
Conder 3100
Stimpson 2987
Henshaw & Co. 2965
Riddle 2984
Brass (accepted) 2685

DAGENHAM.—For enclosing, laying out, draining, and extension of the Burial Ground, for the Dagenham Burial Board. Mr. E. C. Allam, C.E., architect. Quantities supplied:—

Potter £389 0 0
Holmes 386 0 0
Bugbird 375 0 0
Kirk 369 0 0
Goodav 362 0 0
Hughes 352 0 0
Barwell 348 15 0
Hull (accepted) 325 10 0

DRESDEN LONGTON.—For the erection of cottages for Mr. W. Copestake. Messrs. Scrivener & Son, architects:—

Newbon £715
Inskip 698
Harvey 691
Collis & Hudson (accepted) 660

ESSEX.—For repairs to north walls of cemetery at Waltham Abbey:—

Porter £140 0 0
Bentley 137 15 0
Kearley 132 10 0
Hanehet 132 10 0
Gardner (accepted) 130 5 0

THE BUILDING NEWS.

LONDON, FRIDAY, DEC. 1, 1871.

SHAM PLANNING AND REAL DESIGN.

THE present correspondence in our pages on the subject of house planning gives us an opportunity of noticing an important difference, and one which we long since pointed out; the difference between a good plan, and the plan of a good building. The distinction between these seems obvious enough, and yet many people go on to the end of their lives, and never find it out. A good building involves a good plan; but a good plan is no guarantee at all for a good building. By the word "plan," we mean, of course, a plan of general arrangement, unaccompanied by sections, elevations, or details, or by other plans of the floors above and below; and there are many persons who are utterly incapable of conceiving an entire design, who can produce a very plausible plan of this sort. It looks admirable on paper, but once translated into bricks and mortar, no failure can be worse. It causes much surprise that so good a plan makes so bad a building, and the result is not unfrequently attributed to mismanagement in its execution. It is no rare thing for one of these planning geniuses to get on a committee, and act the part of the "practical man" whom we recently described. The less he has learned of architecture, the cleverer his colleagues think him, and the cleverer he thinks himself. They cannot see how thoroughly unpractical those notions are, which look so very plain and simple on paper; they do not understand that he evades more than half the difficulties of the case, and that his fine ground plan would lead to miserable elevations and sections. The truth is, as some of our late correspondents have properly insisted, that there is no such thing as working out a ground plan by itself. It cannot be considered alone; the designer must bear in mind how it affects the plans above and below; how it can best be roofed; how it will look externally, and a multitude of other questions. A building must be designed *as a whole*, for all its parts react on each other, and are inseparably connected; and a mere plan or mere elevation designed by and for itself is one of the most worthless things that can be mentioned. It is, in fact, an example of what we call "sham planning;" it looks, on paper, like one of the drawings of a well-arranged building, but every attempt at completing the set in conformity with it only shows it more and more plainly to be a delusion. It is impossible, without a total alteration, to make other plans, elevations, or sections, that will suit it. And yet, without the other plans, and without elevations and sections of some kind, a building cannot be put up; so that the final result proves a plan of this sort, to be, for all practical purposes, entirely useless. It may serve, as we said before, to captivate a committee; it may gain for its amateur inventor the sort of praise which is always lavished on those who do, however badly, what they have not been trained to; but as regards any real utility, it is not worth the paper it is drawn upon.

We happened, some time ago, to meet with a book on house-planning which just illustrates our statement. The compiler has paid us the compliment of using his paste and scissors more freely on the *BUILDING NEWS* than on any other publication, and as regards the letterpress we have little to say. Many of his plans, however, appear to be original; we hope, for the credit of house builders, that all of them are so, but as to this he does not inform us. At any rate, they embody nearly all the faults that house-planning is capable of; and those which at first seem

least objectionable, are found on consideration to involve, when worked out, some of the grossest inconveniences. For example, about a third of the ground plans given can only be arranged as they are, on condition of having an impossible staircase. While only a ground plan of each design is shown, this fault does not at first appear, especially as the steps are only indicated in block, so that there is no counting them. Once sketch them in, however, and you see directly that the whole arrangement is upset. On one design, there would be no headway to pass under them; on another design, they would land in a totally wrong place above; on a third they would cut picturesquely into the drawing-room ceiling; in a fourth, they would be so long as to reduce the rooms behind them to mere passages. What the stairs do for some of these sham plans, the chimney breasts do for others. Work out the floor above, which the author has been wise enough not to show, and you find them blocking up doors, standing across passages, and generally making their appearance wherever they are least wanted. Try the passages, again, on any of the few alternative arrangements which are possible on the upper stories, and they come out, as everything always comes out, when it is left to chance, as wastefully and awkwardly as can be imagined. Try last of all, the roofs, which never ought to be out of an architect's mind for a moment when he is devising a general plan, and you discover that they shape themselves, as roofs are fond of doing when their designer does not take pains to shape them otherwise, so as to be as expensive and as ugly as possible. One might suppose that they had a certain kind of misdirected intelligence, and even some rudiments of affection, for they always prefer such forms as are most for the plumber's interests, and often seem ingeniously to contrive themselves as if to run up his bill. There is, however, nothing preternatural about it. The plumber, in modern times, is the general patcher-up of botches and bungs; and if the architect does not design his roofs properly in the beginning, the plumber and his lead flats have to make them weather-tight in the end. A so-called "good plan" that does not admit of a good roofing system is a mere imposture, and a most expensive one. It is far from rare, as any one may see by walking about the streets of London and noticing the wretched parapets with false cornices which are run up to hide roofs whose architects would not take the trouble to design them. It is thus, as witness the buildings now going on in Queen Victoria-street and elsewhere, that people are content to buy ugliness at three times the price of beauty, and for want of giving the little thought required to produce roofs of simple, natural, and artistic shape, have to spend hundreds of pounds, first in constructing them absurdly, and then in concealing the construction they are ashamed of. We have said little of the connection between planning and external design generally; but a most intimate connection does exist. If that cannot be called a good ground plan which leads to bad upper plans and a bad roof, neither can it be called so if it leads to objectionable arrangement of doors and windows and spires. We are far from insisting on rigid uniformity in their distribution. We do not think that in a building cut up into apartments of all sorts and sizes, the apertures are bound to be distributed as evenly as the squares of a chessboard, or planted as regularly in rows as the cabbages in a well-kept market garden. But, on the other hand, it does not follow that their position should be totally left to chance. Our Classic friends for the most part seem to think that it must be either the cabbage-garden system, or no system at all. If they cannot have their windows in so many rows each way, all duly set in rank and file, their ideas are at an end. And yet there are a multitude of other arrangements, new and fresh and interesting,

to be found by those who seek. It is astonishing how many excellent types of elevation have been neglected through this absurd worship of regularity; how much character and even beauty might be given to our monotonous streets if architects would only invent fronts and interiors to suit each other. Now and then we come across an instance in which it has been done—such, for instance, as Mr. Christian's little warehouse in King-street, Cheapside, which we reviewed last summer. Here is a small and simple work, plain in its details, which one cannot help noticing and remembering. The Queen Victoria-street offices, with all their carving and moulding, and shafts and tracery, leave no impression on the mind, except one of satiety. There is nothing in them that we have not seen before; no new thoughts or new ideas or new types of composition. There are so many capitals, and so many consoles, carved neither very well nor very badly, and they have been repeated so often that we shall soon notice them no more than so many headers and stretchers in the wall. But the King-street building, in spite of two or three considerable faults, shows thought and invention. Good or bad, there is something in it. One does not pass it by with a mere yawn of weariness, and its remarkableness, such as it is, is almost entirely due to the well-studied arrangement of the piers and openings. This is what we want to see in house design generally: not an impossible regularity, still less a sham regularity, but a natural and artistic grouping of the doors and windows and piers, which will work out well in the rooms and well from the outside. Such a grouping does not spring up of itself; the architect has to think about it and provide for it, and make sure of it while he is at work on the plans quite as much as on the elevations; and hence the "good plan" that takes no elevations into account is as certain to fail here as everywhere else. We might enlarge on and illustrate all these remarks, but enough has perhaps been said to show that the man who, in arranging his plan, thinks of nothing beyond the plan, will never produce a plan that will be of the slightest use to anybody.

Besides the main principle which we have tried to enforce—the principle that a building must be designed as a whole, and that each part of it must act on, and be acted on, by all other parts—there are, in house-planning particularly, a number of matters which are liable to be overlooked. It is not always easy to see, on first glancing at the sketch of a ground-plan, whether they have been studied or neglected. The book which we have taken as an illustration may aid us here, as in the previous part of the subject; and so, to parody Falstaff's remark, though it is not excellent itself, it may be the cause of excellence in others. By the earnest architect, indeed, there is something to be gained, even from bad buildings and bad architectural books: they irritate him into thinking how to mend them. Had they been successes he might have admired them and passed on; but, being miserable failures, they come upon him as a sort of challenge to try and do better. Taking warning, then, from the plans now before us, we will note, for one thing, that the architect should take care to see that his rooms are capable of being furnished. For instance, it is desirable that in a bed-room there should be room for a bed, in a drawing-room for a piano, in a dining-room for a sideboard, &c. This seems a tolerably obvious requirement, but in the work we are noticing its fulfilment is rather the exception than the rule. In half the bedrooms here shown the bed must stand with its head blocking up either a window, a door, or a fireplace, and in the ground floor rooms the wall furniture must do likewise. The first question then, after the main ones relating to general design, which we should be disposed to ask in reference to a house plan is this, "Will the rooms hold the furniture?" The next question might be, "How are the

room doors placed, especially in reference to the fireplace?" We have seen large and splendid apartments, whose designer seemed to make it his most cherished purpose that the inmates should never get warm. Considerately thinking that the heat of the fire might be unpleasant to those who by force of habit felt themselves compelled to sit round it, he had ingeniously contrived a strong draught in their precise direction; and thus if they chanced to become overheated on one side, they would receive ample compensation by being overcooled on the other. This sort of compensation, however, does not suit everyone, and indeed the prejudice against it is so general that we should advise architects to great caution in making provision for it. The question of aspect as regards the different apartments is a third and a very important one; and before a plan can be fairly judged of, the direction of its sides, and especially its windows, should be known and marked. There should be no such thing as designing a plan first and settling afterwards how it is to stand. It cannot be a matter of indifference whether the breakfast-room is dark or bright; whether the dining-room at the dinner hour is or is not in the full blaze of an afternoon's sun; whether in spring and summer, the drawing-room blinds have to be kept down to shut out the blinding level glare of early evening. The question of aspect has been discussed frequently enough, and yet we have seen too many plans whose planner might be asked, "Would you be surprised to hear that the sun rises in the east and sets in the west?" Then, again, we might inquire, on seeing a plan purporting to be a "good" one, "Are the chimneys ingeniously designed for smoking? Are the flues carried up, for the sake of coolness, within half a brick of the outside air, or are the chimney stacks modestly kept down below the ridges of the roofs? Are there any horizontal flues leading from fireplace to chimney and not arranged so as to admit of sweeping; any beads and twists and ledges to act as store-places against a grand conflagration of soot?" If so we should prefer taking the character of the house from a tenant who had occupied it seven years at least; the items enumerated do not give us an *à priori* idea of its perfection. "What sort of stairs are there?" we might again inquire; for some stairs are dangerous to children from the multitude of winders, and others more dangerous still from their long steep flight, unbroken by a quarterspace. "How are the water-closets placed and how are they ventilated?" In the book which has suggested this list of possible defects, and but for their existence in which we should have thought many of them too glaring to be committed, we see many water-closets with neither light nor air, opening out of parlours and bedroom lobbies and other places equally unfit for them. If this is not inviting fever and pestilence, it is hard to say what is. Then we may ask again, "Are there plenty of cupboards?" People seldom complain of having too many, though they often find too few. Then, again, "How are the various doors placed?" Do they all open clear of each other, or do they here and there lap over, so as to produce amusing cases of jammed fingers and broken noses whenever two persons open them together? How does the front door open? In our treasury of blunders, several front doors, only 3ft. or so in width, must needs be hung folding; there is not room for them otherwise. Now the members of the family, and many of their visitors, may possibly get through an 18in. opening pretty well, and so the chances are that only half the door will be commonly used and the other half bolted. By-and-by comes a gentleman of somewhat ample dimensions: he looks through the half-open door and dares not venture. Then follows the process of unbolting and unbarring the other leaf for his formal entry: the servants feeling that they are engaged in a practical joke of the highest order, and trying

hard not to laugh; the gentleman, if he is of the apoplectic sort, turning redder than ever, and almost believing that it is all planned to insult him. We have witnessed the ceremony, and shall never forget it; and it was with great relief that we reflected on the house where it happened being none of our design. The question of light to rooms and passages is a highly important one. It has, however, been touched on by our recent correspondents, and we need not say much about it. We only remark, in another sense from the poet's, that "it is not always May," and that a passage which is light enough at midsummer may be something more than gloomy in November. We have already mentioned the architectural design of roofs: their design as regards convenience should not, however, be forgotten. We mean that they should not be so arranged as to let their gutters fill with leaves or snow every autumn and winter; that they should as far as possible take care of themselves, and not require the services of a man to clear them from accumulation of this kind; that gutters, where it can be avoided, should not run across a house, and that downpipes should be protected from nests and rubbish. The object of a roof is to keep wet out of a building, but some roofs seem rather meant for funnels to pour it in. We might ask again, in any given plan, "How much waste space is there—space in passages, lobbies, in roofs, which contributes neither use nor beauty to the work?" "How are the rooms situated for access to each other, to the entrance and the staircase?" and many other questions of the same sort. But these are of a kind which usually meet with attention; and our object has been to prove that attention to them, though highly important, will not by itself make a good plan. A good plan, in the true sense, is not one which, taken alone, looks very prettily and ingeniously arranged; but one which, worked out and completed by all the other drawings which are necessary, does its part as the basis of a really good house.

THE RICHMOND COMPETITION SEWAGE PLANS.

BESIDES the plan of the successful competitors, eighteen different sets of plans have been sent in, according to the terms of the advertisement. Last week we described the prize plan. We now give some description of the unsuccessful plans, but instead of describing each one in detail we intend to classify them. This is easily done. They all come under one or another of three ways of utilising the sewage as a manure, either, that is to say (1), by precipitating the fertilising ingredients and recovering them as a more or less solid manure, and for this purpose adding to the sewage such foreign ingredients as may be in the opinions of the respective authors of the plans be the best for the purpose; or (2) by leaving the fertilising ingredients in the liquid and irrigating land with it, and as to the solid part of the sewage, treating that merely in a mechanical way by subsidence and straining before the liquid is delivered on to the land, and to some small extent utilising this solid manure by mixing with it the street sweepings or other rubbish and selling it at a small price per ton; or (3) by separating the solid sewage from the liquid by filtration. By treating the solid sewage chemically perhaps £2 per ton may be obtained for it, while by treating it merely mechanically 2s. per ton may probably represent about its value after it has been dissolved, the chief fertilising ingredients being retained in the liquid with which the land is irrigated; but by the third process a value is claimed for the solid manure equal to that claimed for it after chemical treatment. This latter plan is that of Mr. C. E. Austin, and it differs essentially from all others in this, that while in all others the sewage is allowed to travel to the outfall before anything is done to separate the solids and liquids, Mr. Austin intercepts the solids

in the branch sewers—as soon, indeed, as is practicable after the discharge of the sewage from the house-drains. This plan is obviously open to the question, "Why put that into the sewers at all which you take out again as quickly as possible?"

Only a few of the plans show evidence of much thought having been bestowed on them by their authors, and when we consider how uncertain it is that a vestry will choose the really best out of a large number of schemes radically different in principle, it cannot be wondered at that competitors are rather inclined to be indifferent in the matter, and often send in crude notions rather than well-matured plans. In the present case, however, we fancy we trace the line of argument which could have led to the choice of the plan of "C. E.," in its tentative character. It is indeed, perhaps, as good a plan as the Sewage Committee could have chosen, as far as it goes. Whether the process to which the sewage is to be subjected is sufficient to purify the liquid to a degree commensurate with the requirements of the Rivers Pollution Commission, or of the Thames Conservators, is a question that can be proved one way or the other in the future, and if the plan should prove unsuccessful in that respect, at least the greater part of the money spent on the sewers and pumping works will not have been thrown away, for those or similar works would be required under any circumstances.

Some of the schemes are much more ambitious and final in their character. The largest scheme is that marked "Tria juncta in uno," which proposes to combine Richmond, Twickenham, and Kingston, and pump the sewage to Fulwell, where there is land belonging to Sir W. Clay, Bart., which he will, it is understood, sell as a whole, the whole consisting of 479 acres, but will not sell a part of it. Reserving 50 acres for building land, and 10 acres for the grounds of Fulwell Lodge, it is proposed by this scheme to buy the whole, and to utilise the sewage of the three places named on 419 acres of this land. The sewage of the three combined towns is first to be concentrated in a covered reservoir at Ham Fields, where the pumping station is proposed to be. The reservoir is estimated to cost, with land and fencing, £3,000; the intercepting sewers to bring the sewage from the three towns to this reservoir, £17,200; the engine power to be provided is 140 horse-power, which, at £80 per horse-power, would cost £11,200; the cast iron main through which the sewage is to be pumped would cost £4,900, being 24in. diameter, and 2,000 yards in length, at 49s. per yard; crossing the river, extra, £1,000; purchase of the estate, £120,000; laying out 419 acres of land for irrigation, £3,600; contingencies, £2,345; the total being £162,945. It is proposed to resell 50 acres of building land for £15,000, and Fulwell Lodge with 10 acres of ground for £6,000; the Wellington Inn and cottages adjoining for £3,000; making a total deduction of £24,000, which would reduce the outlay to £138,945, and including engineering and law expenses the outlay may be said to be £150,000.

This is a large scheme, and if large combined schemes for the disposal of sewage were advisable under any circumstances it would have deserved consideration, but taking it as it stands it is an instance of a crude notion rather than of a matured plan. It must have cost the author a great deal of both time and money, and yet it cannot be said to comply with the requirements of the advertisement of the Sewage Committee, in which they ask for the best plan of disposing of the sewage of the parish of Richmond only. Whatever may be the reason of it, the fact is that local boards of towns do not voluntarily combine in carrying out a joint work such as this in question. The time allowed to competitors in which to prepare their plans and reports

was one month and fourteen days, a time possibly sufficient for a well-matured scheme for Richmond alone, but wholly insufficient for so large a scheme as this we have given an outline of, unless the towns had previously decided upon combining, and the author, by attempting too much, has, or will have, his plans returned for his pains.

The plan of "Viator" and that of "M. R." are noticeable for this, that the authors of both plans had a preliminary understanding, or sort of agreement, with the owners of the land they proposed to take for irrigation to the effect that they would sell 200 acres at a fixed price per acre, and this offer was embodied, and formed part of the report of each of these authors. This is a new feature in competitions for premiums for plans for the disposal of town sewage, and may afford a useful hint to other competitors elsewhere. The land is called the Tangley Park Farm, and belongs to the Messrs. Grover, who offered to rent the farm, after it should have been irrigated with sewage, at the rent of £10 an acre for the first year, £12 for the second, and £15 for the third and succeeding years. Fifteen pounds an acre for a well-sewaged farm is not comparatively much. The author of the plan marked "Viator" reports that if the land be held and farmed by the local authority £25 per acre per annum may be reckoned upon as a reasonable return. His plan for the disposal of the sewage of Richmond is to take it across the river to a pumping station to be established at Ranelagh Drive, Isleworth, and to pump it thence through an 18in. cast iron main $3\frac{1}{2}$ miles in length, following the line of the railway, to the land at Tangley-park, near Hampton. Taking the present population of Richmond at 15,000, he makes the permanent works of sufficient capacity for the requirements of twice that population, at the rate of 5 cubic feet of sewage per day per head of the population, or a daily quantity of sewage of 150,000 cubic feet, and he makes provision for an equal quantity of rainfall, or together 300,000 cubic feet per day of 24 hours. It is stated that the quantity of sewage per acre of land that gives the best results is 5,000 tons per annum, which is sufficient to produce 40 tons of grass, the gross value of which is estimated at £35. Meadow-grass, when sewaged at the above-mentioned rate, will, it is said, with cows taken indiscriminately at various periods after calving, produce an average of not less than 1,000 gallons of milk per acre.

The estimate of the cost of these works is as follows:—

Two 40 horse-power engines, with boilers, pumps, and buildings	£5,600
24 miles 18in. pumping main	8,896
Extra for crossing Thames	500
Reservoir and site of pumping station	5,000
Solid sewage extractors	1,500
Laying out the land for irrigation, including carriers, sluices, &c.	2,000
Compensation	1,000
	£24,496
Contingencies and engineering expenses	2,496
	£26,992
Purchase of 200 acres of land	40,000
Total	£66,992

The annual expenses are as follow:—

Interest on £66,992 at $4\frac{1}{2}$ per cent per annum	£3,014 12 9
Sinking fund to pay off principal in 50 years	375 3 0
Cost of management of farm, including superintendence, at £4 per acre	800 0 0
Coal, 240 tons at 2s.	264 0 0
Two engine workers at 35s.	182 0 0
Two stokers at 20s.	104 0 0
Oil, 80 quarts at 2s.	8 0 0
Tallow, 880lb. at 6d.	22 0 0
Yarn, hemp, and sundry stores	20 0 0
Wear and tear of machinery, 2 per cent. on £5,600	112 0 0
	£4,901 15 9
Towards the repayment of this annual outlay it is estimated that there would be the following receipts:	
150 acres at £25 per acre	£3,750
50 acres at £16 per acre	800
	4,550 0 0
Deficiency	£351 15 9

For this sum, a rate in aid would have to be made.

Twelve of the plans are for irrigation, of which eleven are for surface irrigation (and of these those we have described may be taken as examples), and one for underground irrigation. By this plan it is proposed to meet the difficulty that the Richmond Committee had when, a few years ago, they proposed to take the Old Deer Park for surface irrigation; but, this land being what is called Crown property, it was refused to them for that purpose. The author of this plan apparently puts it forward as a temporary rather than a permanent measure, the object being to gain time for further consideration of the whole question, while yet complying with the requisition of the Thames Conservators to at once stay the action of discharging the sewage into the river. It is considered that two desirable things would be accomplished by this plan: the one that we have mentioned (the gaining of a few years of time), and the other the doing away with any possible objection, real or fanciful, that the adjoining residents might have to a system of surface irrigation. Rows of common land-drain pipes, with open joints, are proposed to be laid beneath the surface, and that the sewage, after being strained from all solid matter, should be delivered into the upper ends of these rows of pipes, which would escape into the soil at the open joints, and be soaked up by the capillary action of the porous soil, and feed the crops at their roots and rootlets, by which it is expected the growth of grass would be much promoted, and, that being so, the property would be improved for the time being as grazing land. The works necessary to pump this liquid sewage into the pipes would be of similar character to those of the plan adopted, and would be, like them, suitable and necessary for whatever ultimate plan might be adopted; and it is supposed that during the few years that the Old Deer Park might be thus made use of the best method of dealing with town sewage will have been decided upon. The cost of this plan is estimated at £10,000, and the rate required 2d. in the pound, to be reduced by the sale of manure to 1d.

There is another plan, marked "Vive valeque," which deserves notice. By it, it is proposed to treat the sewage chemically, by a first operation, and afterwards to filter it through downward intermittent filters. We consider this feature to be an extremely good one. Since Dr. Frankland and Mr. J. C. Morton reported to Parliament that intermittent downward filtration could be made to purify sewage sufficiently to come up to their own standard before being discharged into rivers, a good deal has been said on the subject, and something done, and it seems extremely likely that this method may ultimately become an adjunct to any other system, if not, indeed, solely the method of treatment, and for this reason we look upon this last-named plan as one of the best sent in.

DILAPIDATIONS.—V.

LAY.

THE surveyor will first inspect the front of the premises of which he is required to take the dilapidations; next in order are the roof, chimneys, and party walls; then the top floor in the house; next, the staircase from that floor to the floor beneath, thus taking floor after floor until he reaches the basement, or the floor in which the kitchens, &c., are situate. Having inspected these, and made memoranda of all the requirements, next he will take the dilapidations of back-front, then the back-yard, and, lastly, out-buildings. It is most important always to take the items in the same order, because, in giving evidence, one can also find out where the item appears; and, therefore, in taking the list, if a room cannot be seen from any reason (such as tenant being out or ill), it

will be found a good plan to leave a space, so that when the dilapidations can be taken they may appear in regular order in the schedule; if this be not done, it will be well to make a reference to the place where the items may be found. The above is the usual order, and should be strictly adhered to. I will now proceed to point out the most usual dilapidations; but my reader must remember that they will vary in every house, and that, therefore, he must use most scrupulous care, or he will unintentionally injure his client's interest. He should remember that, in the result, it is not of much consequence to his client whether he is injured by a want of knowledge on the part of his surveyor, by his carelessness, or by his dishonesty. It therefore behoves every one to try and thoroughly understand, and be master of, his profession, so that his client may not suffer by the former of these causes; he can always then be certain whether or not he is doing his duty.

Knowing the order in which the dilapidations are to be taken, and having book, pencil, 2ft. rule, and a copy of the covenants to repair and to yield up with him, the surveyor will do well to read most carefully the covenants, as they vary very much in stringency. To give one example: I remember a lease at a very small ground-rent, for a term of 80 years, in which the repairing covenant was limited by the words "fair wear and tear excepted," and it was contended that such a covenant gave the lessor no right to require any reparation except waste. This is not so; but I mention the case to show how necessary it is carefully to study the covenants. Perhaps it will be well here to give the usual wording of the covenants. First, I think I should mention what is not generally known, but which may somewhat trouble the surveyor. A lease may be made under an Act of Parliament, the 8th and 9th Vie., c. 124, which, if it uses certain expressions, means more than expressed, as thus written:—

And to repair

MEANS, AND MUST BE SO CONSTRUED, "and also will, during the said term, well and sufficiently repair, maintain, pave, empty, cleanse, amend, and keep the said demised premises, with the appurtenances, in good and substantial repair, together with all chimney-pieces, windows, doors, fastenings, water-closets, cisterns, partitions, fixed presses, shelves, pipes, pumps, poles, rails, locks and keys, and all other fixtures and things which, at any time during the said term, shall be erected and made, when, where, and so often as need shall be."

Again: *And to paint outside every — year:—*

"And also that the said lessee, his executors, administrators, and assigns, will, in every — year in the said term, paint all the outside woodwork and ironwork belonging to the said premises with two coats of proper oil colours, in a workmanlike manner."

And again: *And to paint and paper inside every — year:—*

"And also that the said lessee, his executors, administrators, and assigns, will, in every — year, paint the inside wood, iron, and other works now or usually painted, with two coats of proper oil colours, in a workmanlike manner; and also re-paper with paper of a quality as at present, such parts of the premises as are now papered; and also wash, stop, whiten, or colour such parts of the said premises as are now plastered."

Remember, in the deed it *must* be expressed that it is made in pursuance of this Act. I only recollect one instance of having to value dilapidations under a lease made in this form. I mention it, however, because, now that solicitors can arrange their costs by the recent

Act of Parliament upon a different basis to the old system, it is probable it may be generally adopted; it could hardly be expected that when everything was paid simply by its length, that the legal profession would eagerly adopt an Act which lessened their profits. It would be a great boon, however, should this Act become general, as it would give uniformity of covenants, and thus help to make dilapidations a more *known quantity*. We must, however, deal with things as they are.

Woodfall considers the following to be the proper repairing covenant in a lease:—

"AND ALSO will, during the said term, well and sufficiently repair, maintain, pave, empty, cleanse, amend, and keep the said demised premises with the appurtenances, in good and substantial repair, together with all chimney-pieces, windows, doors, fastenings, water-closets, cisterns, partitions, fixed presses, shelves, pipes, pumps, pales, rails, locks and keys, and all other fixtures and things which at any time during the said term shall be erected and made, when, where, and so often as need shall be: AND ALSO will in every — year of the said term paint all the outside woodwork and ironwork belonging to the said premises with two coats of proper oil colours in a workmanlike manner: AND ALSO will in every — year of the said term paint the inside wood, iron, and other works now or usually painted with two coats of proper oil colour in a workmanlike manner; and also repaper, with a paper of a quality as at present, such parts of the premises as are now plastered;" and the covenant to leave or surrender at end of term is thus defined: "AND FURTHER, that the said lessee, his executors, administrators, or assigns, will, at the expiration or other sooner determination of the said term, peaceably surrender and yield up unto the said lessor, his heirs or executors, administrators, or assigns, the said premises hereby demised with the appurtenances, together with all buildings, erections, and fixtures now or hereafter to be built or erected thereon, in good and substantial repair and condition in all respects."

The Select Committee on Dilapidations appointed by the Royal Institute of British Architects, in their report stipulate nearly the same covenants as the foregoing. They state that they had invited her Majesty's Commissioners of Woods, Forests, and Land Revenues, the Corporation of the City of London, many of the principal chartered companies of London, and other corporate bodies, and the agents of several noblemen and other owners of large estates, to send them copies of the covenants usually required by them, in their respective leases, to be entered into by the lessees in respect of repairing, rebuilding, and surrendering the erections and premises leased therein, and having compared them they then proceed to give the forms which they consider contain the covenants most usually adopted. They are as follows:—

"And also that the said his executors, administrators, and assigns, shall and will, at his and their own proper costs and charges, well and sufficiently repair, uphold, support, sustain, maintain, slate, tile, glaze, lead, paint, pave, purge, scour, cleanse, empty, amend, and keep the said messuage or tenement, and all and every other the erections and buildings now erected and built, or that shall or may be erected and built, on the said piece or parcel of ground hereby demised during all the said term hereby granted—and all pavements, walls, party-walls, fences, pipes, gutters, water-courses, privies, sinks, drains, cesspools, sewers, and appurtenances belonging, or that shall or may be made or belong to the said premises, or any part thereof, in by and with all needful and necessary reparations and amendments whatsoever, when and as often as used or occasion shall require during all the said term hereby granted.

"And also shall and will once at least in every three years of the said term hereby granted, in a good and workmanlike manner, paint or cause to be painted all the outside wood and ironwork of the said messuage or tenement, coach-house, stable, and premises hereby demised, and all other parts of the outside thereof heretofore painted, with two coats of

good oil and lead-colour at the least. And shall and will in like manner paint or cause to be painted all the inside wood and ironwork of the said messuage or tenement, coach-house, stable, and premises hereby demised, and all other parts of the inside thereof heretofore painted, once in every seven years of the said term."

They will be found to agree almost entirely with "Woodfall," except that where he mentions — years for outside and inside painting; the result of their investigation led them to fix the external painting at every three years, and internally every seven years. There can be no question as to their accuracy in thus fixing the periods for painting. The very large majority of leases are so drawn.

We will, then, consider dilapidations with reference to the usual covenants as thus explained; the surveyor will, of course, take care to note any especial matter which may arise out of exceptional covenants. He commences thus:—

Front of House.—1st.—Look particularly to see if any open joints of stone parapets, and if brick flat, and brick on edge coping and tile creasing.

Because, if pointing is required, the walls are being permanently injured.

2nd.—See if any open joints in brickwork of main walls, and note what sort of pointing, whether struck joint, or tuck and pat pointing, or what kind.

The object of taking this note is that you may be sure, on a future inspection, if the joints of the walls have been raked out and re-pointed, that it is done in the same manner as when you first saw the premises.

3rd.—The reveals, if cement, see whether they are sound or cracked; and if painted, the state of the paint thereon.

4th.—Sashes and frames, note the general appearance.

These will be again inspected when you are taking the inside items.

5th.—Front entrance door and frame, other doors, fanlights, wood cills.

6th.—Fencing, gates, area walls and areas.

7th.—Stone steps, stone landings, copings, &c., brick and stone paving; remember that cracked and broken bricks and cracked and broken stones are dilapidations.

It is well here to mention that it is no answer to say that broken bricks and stones, if cemented up, may still carry off the water; it is clear that the breakage of stone or bricks is *not* the effect of time, and therefore has required the active agent force to injure it, consequently it must be a dilapidation. A settlement might produce it, it may be advanced; but then this proposition is met by the rejoinder, "Well, but how did the settlement occur?" Through negligence of the fabric by the lessee most likely. Still, if this be so or not, the almost invariable custom is that broken stones are dilapidations, and I think most justly; what is demised should be returned entire, and no one can say that broken pavement is so pleasant to walk on or in appearance as that which is sound.

8th.—Gravel walks, see that they are fairly kept free from grass, &c.

9th.—Garden and grounds, fields, pasture and arable.

These dilapidations are more difficult to the London surveyor, because they less frequently come under his notice. I have shown by the authorities that no difficulty exists in taking the covenants in town leases and agricultural leases as to the houses and buildings; but in assessing the land, where the covenant is in the usual form, "and shall in all respects farm in a husband-like manner, according to the custom of the county in which the land is situate;" and where no covenant exists, as in the case of a yearly tenancy, recollect the law implies the existence of this covenant. Well, the surveyor, by inquiry, must find out what is the custom of the county; and a warning here may advantage him. The custom of the country cannot be inferred from the custom on one estate, no matter what extent that estate may be. The most limited interpretation I think that can be found of good husbandry is that no two crops of what is called white grates shall directly follow each other; that where, for instance, wheat, barley, or oats are one year, the next crop shall be roots, artificial grasses, or a fallow, or partial fallow; that all hedges shall be kept trimmed, and gates and fences, so that they answer the purpose for which they were put up. This is the very easiest construction that can be put on the covenant. It will, however, sometimes be found that a fallow is the custom every — year, and the value of this

fallow is large, because it is presumed to be more efficacious than manure by some. There is therefore the value of the manure, and to be added thereto an indefinite sum to cover the *opinion* of the county, which is really the guide in this instance.

10th.—If any lodges, or other buildings in addition to the house, every such building will have to be treated exactly as the main building, and the same routine will have to be adopted in taking the dilapidations.

Next we come to the inside of the premises, and I think it will aid my reader if I continue to number each item; I therefore do so.

11th.—First go on to roof; you must not mind the difficulty, the unpleasantness, and dirt; usually the easiest way is through the trap door leading thereto from the attic. Specially notice the brickwork of chimneys, if any open joints, if stack upright, if any chimney pots deficient, if pointing to pots defective, if pointing of inside of parapet walls good or bad, if pointing of those portions of party or external walls which can be seen from roof are defective; then see to ridges, hips, and valleys, if sound or loose, if any nails defective; then the lead and iron gutters, if the fall is correct, or if rendered imperfect through any sagging of woodwork below. In this case the requirement will be, Take up the lead or zinc gutter (as it may be) fir up joists and relay same, also see if roof timbers have sagged. Next if any stone coping defective, if the lead or other cramps to same are perfect, if any open joints of the stone or brick coping, if cement coping be in order, and, if it has been before painted, the state of the painting. If (and this is a very important, because a large item) the slating or tiling is in order, if any slipped slates or tiles, if the pointing of tiles (pan) is good and sound, if slating is perfect; try as a test one or two slates, you can easily find out if the nails are *gone*. I may here observe that great expense may be necessary where at some time in repairing a slated roof iron nails have been used instead of copper or zinc, the iron corrodes entirely in a comparatively short time, and the only way the slates are retained in position is simply by their weight. A heavy storm will, therefore, remove them, and great and undeserved expense may therefore fall on the lessor at end of term if this is not tested. Lastly do not forget the trapdoor by which you gained access to roof, generally you will find it wants painting. Now come we to the inside. One story so much resembles the other that to save space I shall illustrate the mode of taking internal dilapidations to one floor and one flight of stairs.

12th.—Inside: First, always look at the sashes and frames; if any sash lines broken; any glass cracked or broken (in inferior rooms it is usual to allow one crack to pass, but in the best rooms, as reception rooms, this does not obtain); if the sashes will open properly; if the fasteners are defective or in proper working order; if the sashes, frames, or sills are decayed or being injured for want of paint, if the pointing round frames is defective; if outside and parting beads are perfect. Next the shutters, if in working order, if fastenings perfect, if the architrave mouldings are in good condition. Next the state of the ceiling of the room, if any bulged or loose plastering (this would require the entry in book if very bad, "cut out defective, loose, or bulged (as the case may be) plastering, relath, prick up, float, and set and twice whiten, &c.;" but where the ceiling is not so bad the item would be, "wash, stop, and twice whiten." Walls come next. See if the plastering is perfect, then the papering or colouring; if paper torn, or merely soiled.

If there is any time mentioned in lease when the re-papering should be done, it will wise, by inquiry, to try and confirm the judgment, where the chance of uncertainty exists in the mind, whether it has been done during the prescribed time.

Remember, if in doubt, it is usual, as in criminal trials, to give the benefit of the doubt to the prisoner at the bar, which

in dilapidations means to the lessee. The next items are mantel-pieces, and here care is required in dealing with the more expensive kinds. For instance, a mantel-piece worth, say, 100 guineas, may be almost destroyed by an injury that 5s. or 10s. would remedy in the commoner sort. See if jambs or mantel or mantel-shelf are chipped or cracked (I may mention in old houses, cracked mantels and jambs are of frequent occurrence). Then follow front and back hearths; these will very often be found to be cracked, especially in the smaller class of house, where the front hearth is often used to chop the wood for the fire on—this, though to some it may seem incredible, is *really* the case; make a note if of stone, cement, or marble, and if marble, what kind. Next, cornice and skirtings; see if any enrichments are deficient of the former, or any injury done thereto by nails or window cornice poles, &c., as to the latter what injury done by chairs to paint or mouldings, then doors of the room and to cupboards (if any), see if any split panels, cut or damaged mouldings; if fastenings, knobs, handles, and locks, in good order. Next, see if the floor is sunk (then note the cause and quantity) or decayed. It will be some guide to notice where the skirting joins the floor boards, as where the walls have bulged it will sometimes be found that there is a vacancy between the end of the floor and the skirting, which may require structural amendments in the fabric to rectify. Lastly, the painting and graining; note the age, and state, if chipped, if "worn to wood." Sometimes if work grained, it will be sufficient, to meet the covenant, to require that the grained work shall be touched up, top grained, and twice varnished; but here judgment is required. Always FORTIFY opinion and judgment by facts when you can. This is good advice.

After the rooms are taken, first, the front room or rooms, then the back room or rooms, take the landing and staircase leading from that floor to the floor below. Begin at the landing, ceiling, or the soffits of the stairs (in the top floor notice if ceiling damaged by the wet); then the walls, if plastering sound; next the paper, if paper varnished and defective, specially note that the new papering must be varnished. Take account next of handrail and balusters, if any deficient, if stringing sound, and the wooden steps have not by any settlement been drawn out of the housings. Do not forget the windows on the landings, taking the items in the same way as the windows in the rooms already described. Then all doors and cupboards, and their locks and fastenings. The room doors will be limited, of course, to their external face. Next the steps: see if nosings and treads are in proper condition. If stone, note if so worn as to be dangerous. I may here mention an example of a stone staircase in a newly-built house. It was let to a gentleman, and he kept a school there; and the stone staircase had no covering. At the end of twelve months he wished to leave, and I think I never saw so awkward or dangerous a staircase, through the constant use by boys; nor could the tenant understand that it could be any dilapidations; although he had not even the excuse that it was let to him as a school. He admitted nothing was said at all on the subject, and his landlord might have believed he wanted the house for a private house.

One floor, then, will serve as an example for all the rest. In the basement it will be necessary to remember to visit all the cellars, pantries, larders, and other places; it will also be sometimes found that the joists are decayed through dry rot. I may here mention that all rafters, ceiling, and flooring joists, and other timbers should be viewed as far as they can on each floor to check their soundness; and in vaults be particular to see that the vaulting is in good order. In yards the paving will require particular attention. All cracked and broken stones should be taken with their measurements if the object of the survey be to make a valuation.

I think I have fully explained *how to take dilapidations*. I therefore propose, lastly, to schedule under the different TRADES the respective dilapidations, so that it may be at all times most easy for reference where any doubt arises. B. F.

NOTE.—I will reply to the letters received on this subject next week.

ART TEACHINGS OF THE INTERNATIONAL EXHIBITION.—V.

BY OMICRON.

SCULPTURE, ENGRAVING, AND PHOTOGRAPHY.

MR. RICHARD WESTMACOTT'S Report on Sculpture will be read without offence, if not with extreme interest or with high educational results. Finding little or nothing worthy of special criticism amongst the works contributed for exhibition, he wisely contents himself, for the most part, by making some general observations on the principles, purposes, and legitimate applications of the art—observations in which it is impossible not to a great extent to concur, inasmuch as they are little else than a repetition of what has been already over and over again said by acknowledged authorities on the subject. We especially agree in the regret implied by him at the present prevalence of portrait sculpture, with all its minutiae of costume, which has been fostered by the miserable and mercenary testimonial mania; agree, also, in his argument insisting that sculpture is a purely formative art, to which the application of colour is illegitimate, except, perhaps, in special cases, when the work is intended simply for decorative purposes. The example in the Exhibition which called for his remarks on this subject was the group of the "Woman and Child," by the late John Gibson; and Mr. Westmacott sums up his case by observing, "Our worthy countryman based his practice in this particular innovation on the assumed authority of the ancients; but the fact—which, however, must be admitted with considerable qualification—that in some instances the Greeks employed, in their sculpture, accessories, as paint (and then always as thick body colour) and other materials, affords no sufficient argument for their use by modern sculptors, either as a justifiable practice or as a means of improving sculpture." Lord Houghton, who, as editor of these reports, allowed the numerous inaccuracies, contradictions, and other absurdities which we have referred to in former articles, and others which we shall yet have to mention, to pass unnoticed, has thought it necessary to append a note to these very orthodox and sensible remarks of Mr. Westmacott in the following terms:—"This must be taken as the individual opinion of an eminent artist." By this marvellous editorial effort his lordship, of course, intends to intimate that his opinion is at variance with that of the "eminent artist"; but before committing himself thus far as a partisan in a controversy of comparatively recent origin he would have done well to reflect that, though the "individual opinion" of Mr. Westmacott is alone expressed in his report, it is an opinion shared by the great majority of those who have well considered the question, whether artists or others, and that the contrary doctrine has been but recently taken up by a few self-willed experimentalists, and probably with the sole purpose of obtaining a new and meretricious effect, no matter at what sacrifice of congruity, or of the true principles of beauty. In taking leave of Mr. Westmacott, we cannot but express our surprise and regret that so respectable an artist, and so sensible a man in regard to subjects immediately connected with his profession, should have suffered himself to be so far enthralled by the Courtly influences pervading the '51 Commissioners, as to open his brief paragraph of eighteen lines on British sculpture by toadying a scion of Royalty in such terms as these:

"In commencing with the British department, it is gratifying to find that H.R.H. the Princess Louise shows her interest in art by contributing a statuette to the Exhibition." If he could have said that her royal highness had shown genius or technic skill as a sculptor, it would doubtless have been more "gratifying" to his feelings; but, in face of the "statuette," he could not say anything of the sort, and therefore we must remain satisfied and proud with the assurance that her royal highness "takes interest in art."

The subject of Engraving has been divided into two branches, copper-plate and lithography being assigned to Mr. Julian Marshall, and wood engraving to Mr. Thomas J. Gullick. Through some curious blundering, the two reports are printed in the order stated, being the reverse of that in which wood and copper-plate engraving were respectively invented, and the consequence is that we have Mr. Marshall anticipating, and even going into fuller statements about wood engraving itself than Mr. Gullick. Unfortunately, also, neither gentleman shows anything like a ripe acquaintance with his subject; and, as the result, we have much erroneous or confused statement from both. Where, for instance, does Mr. Marshall find authority for his assertions that wood engraving, as seen in the block books, is a "form of book and illustration of very ancient origin, and seems to have been common to most civilised nations," and that "the Chinese have used it for many, it is difficult to say how many, centuries"? Whereas the earliest authentic wood engraving with a date known in Europe is the S. Christopher (called the "Buxheim Print," after the name of the convent in which it was discovered), and the date of which is 1423,* and that with respect to the claim of the Chinese, the non-mention of the art as being used by them in the report of Marco Polo of his mission to that country, written in the closing years of the fourteenth century, is considered conclusively to negative that supposition. But on this latter point more anon. And what authority is there for the statement that, speaking of the time of Maso Finiguerra, that is about the middle of the fifteenth century, "Woodcuts had already been long popular, and in the possession of the poorest as well as of those who had the means of buying the most costly works"? and that "engravings (on copper) soon were known equally well, and supplied the cottager with the designs of sacred or secular art which had hitherto been seen only in the collections of the most wealthy merchants or nobles"? Amongst numerous impediments to so wide a distribution of works in engraving, whether in wood or copper, at the early period referred to, was the scarcity and costliness of paper. Paper making from cotton was first introduced by the Arabs into Spain about the middle of the twelfth century, but the produce was very coarse; and the first paper mill in Germany was that established at Nuremberg in 1390, only thirty-three years before the date of the S. Christopher, and only half a century before the period when Mr. Marshall speaks of printed engravings being spread broadcast throughout the land, equally in the cottage as the palace. This is another specimen of loose writing which passes muster under Lord Houghton, but which is calculated, when it is read, to do a great deal of mischief.

In regard to the invention of copper-plate engraving Mr. Marshall perverts known materials in a most provoking manner. The ancient process of embellishing metal objects with incised designs, which were filled with a black substance (thence called "niello") and the practice of taking proofs from them upon soft earth, sulphur, or paper has often been

* Within the last few years, and since the publication of the S. Christopher in Otley's History, some additional early wood engravings have been discovered; amongst the rest the famous Brussels Virgin, with the date 1413; but its authenticity has been matter of dispute.

written about; and that upon this practice followed the art of engraving upon copper for the purpose, not of embellishing its surface, but of taking impressions from it upon paper, is now pretty well a matter of agreement with all writers on the art. The only question which has been in dispute is as to the first practitioner of the art of engraving, and whether he was of Italian or German origin. Heineken and Bartch stood out for Germany, their native country, Zani and Ottley stood out for Italy, and now the question has been decided in favour of the position of the latter, with the assent of Bartch. But Mr. Marshall must have but a vague notion of this controversy, and of the importance of dates as bearing upon its solution, when he speaks of "the date of the first print, about A.D. 1450;" whereas by the discoveries and arguments of Ottley and Zani it has been clearly established that the famous *pax* by Maso Finiguerra of the Coronation of the Virgin was completed not later than 1452. And again Mr. Marshall cannot have carefully consulted his authorities when he vaguely states that copper-plate engraving "was invented in Italy about the year 1452." Ottley, in his "History of Engraving" after referring to the *pax* of the Coronation of the Virgin, distinctly states that he then (1816) had in his collection another *pax* by Finiguerra, which from internal evidence he considered to be of earlier date by about ten years, or say not later than 1445. The earliest date upon a German copper-plate engraving is 1461. The subject was one which well deserved to be treated with a little more precision than Mr. Marshall has aimed at.

In regard to the display of engravings provided for the International Exhibition, we all know that it was poor enough. Mr. Marshall says that "as far as it went it was interesting, and gave some promises," adding "but we should have been glad to see more in number, and more recent productions exhibited by the best engravers." There is no doubt that photography, which has completely destroyed the beautiful art of miniature painting, has also, with its various allied processes, seriously discouraged copper-plate engraving. Lord Houghton, in his editorial capacity, appends a grumbling note upon the comparative desuetude of line-engraving, and almost implies that it is owing to the fact "that the whole commerce in this department is in the hands of one art-publisher, and depends for existence on his liberality and sense of duty to his profession." This would seem to involve a rebuke upon Mr. Graves; but, so far from its being merited, we believe that nothing would give him greater pleasure than to find additional subjects worthy to be engraved in line, and engravers able and willing to undertake the task, and of fulfilling it within a reasonable time. But the world moves fast, and taste changes quickly in our day; and it is just possible that a highly popular picture—one well-puffed by the critics in the exhibition notices, might be forgotten or superseded in public estimation by some more recent favourite, in the course of the five, or perhaps fifteen years which, under ordinary circumstances, it takes to finish a line engraving. Hence, of necessity, the frequent resort to mezzo-tinto, dot, and stipple (which have powerful recommendations of their own) in producing a popular subject.

Mr. Gullick commences his "Report on Wood Engravings in the International Exhibition" with an oratorical declaration of the importance of the art of wood engraving "as a visual educational agency"—an expression which, though it sounds very grand, is not exactly correct, the adjective "visual" being applicable to that which is used, or the instrument which serves in the process of seeing, not to the object seen, which is "visible;" but let that pass. The exhibits in this department, as in that of copper-plate engraving, being few and unimportant, do not

afford Mr. Gullick much to report on, and he consequently follows the example of his colleague, Mr. Marshall, by filling up the bulk of his sixteen pages with a dissertation on the practice and history of the art. In the latter branch of his subject—a theme which has employed the pens of so many able investigators—Mr. Gullick does not appear to be much better informed than we have found Mr. Marshall to have been in his department of the art. He incontinently adopts the old stereotyped theory stated by Strutt in 1785, and repeated even in the last edition of the *Encyclopædia Britannica*, which assigns to Germany the invention of the art; altogether ignoring, or treating as unworthy of notice, the erudite arguments of those who have sought to establish that it was first practised, in Europe, in Italy, being probably introduced through Venice from China. "Mr. Ottley," he says, "believed the art to be of Chinese origin, but—though this is not improbable—the grounds which he gave for his opinion are shown in Jackson and Chatto's able 'Treatise on Wood Engraving,' to be bare assumptions." One of the principal arguments against the supposition that the art was invented by the Chinese is the fact that Marco Polo makes no mention of it as amongst the accomplishments of the Chinese, in the report of his expedition to that country, from which he returned in 1295. But Ottley meets this objection, not without some semblance of reason, with the following observation. "Marco Polo, it may be said, did not notice this art in the account which he left us of the marvels which he had witnessed in China. The answer to this objection is obvious; it was no marvel, it had no novelty to recommend it, it was practised in 1285, as has been seen, at Ravenna" (referring to the engravings by the Cunio, brother and sister, mentioned by Papillon, and whose story has been closely scrutinised by Ottley, Zani, and others, without being successfully shaken). Further on Mr. Gullick proceeds in the same easy, offhand manner to declare that "the claim of a Venetian origin of the art, which has been set up by Mr. Ottley and others, seems to be without foundation." We almost suspect that Mr. Gullick's supercilious treatment of the researches and arguments of "Mr. Ottley and others" have been obtained from a perusal of Jackson and Chatto's "able" work, and not from a study of the originals. As regards the pretensions of Venice, Mr. Gullick cannot have read Ottley's "History of Engraving" with much attention, or he could not have overlooked an important document therein cited, being a decree of the Government of Venice, dated Oct. 11, 1441, which commences as follows: "Whereas the art and mystery of making cards and printed figures, which is used at Venice, has fallen to total decay; and this in consequence of the great quantity of playing cards and coloured figures painted, which are made out of Venice, to which evil it is necessary to apply some remedy;" and then follows a prohibition against importing such painted or printed works, under heavy penalties. Upon considering this important state paper, it seems difficult to suppose that an art, the products of which continued in great demand, should have "long fallen into decay," within a considerable lapse, probably of the greater part of a century from the date of its being first used; and, viewing the matter in this light, we should arrive at the middle, or latter part of the fourteenth century, as the date of the first use of wood engraving in Venice.

Mr. Gullick, going beyond his prescribed subject of wood engraving, very authoritatively asserts that "the first invention of printing with moveable types . . . is, there can be little doubt in the unprejudiced mind, to be attributed to Gutenberg, who commenced his experiments at Strasburg about 1436," ignoring altogether the claims of Laurence Costa of Haerlem, first propounded by Hadrian Junius at the commencement of the

sixteenth century, ably supported by Ottley in his "History of Engraving," and again in a posthumous work, "An Enquiry Concerning the Invention of Printing," published in 1863. Those claims, however, are now beginning to be recognised, and Junius's statement is acknowledged by respectable authorities to be authentic. Mr. Gullick goes on to say that "the first book produced by the new process" was "the Psalter printed by Faust and Scheffer, at Metz, in 1457." Whereas Gutenberg's Bible was published somewhere between 1450 and 1455.

Referring to the very scanty display of modern wood engravings made at the Exhibition, Mr. Gullick particularly regrets the "abstention" of the proprietors of the *Illustrated London News* from sending in specimens of their engravings, adding that this journal "probably has done more to extend and develop wood engraving than all other agencies combined. In these sentiments we cannot concur. The *Illustrated London News*, by its rapid production of coarsely-designed, and as coarsely-engraved, representations of passing events, has not done anything to develop or encourage art in either respect; but, on the contrary, has reduced it to a purely mechanical process of the humblest and most unambitious order. Such men as Williams, Linton, Thomas, &c., contributed to it in its earlier days, when its sale was smaller, and its working more *soigné*, than it grew to be in later years, and we are not aware that a single artist has been made by it to take rank with them. The coloured supplements by the Brothers Leighton are abominations. And, what is worse, the evil influence of the slap-dash style introduced by this journal has extended to our book illustrations; which neither in point of drawing nor execution are to be compared with those of the last generation.

Colonel Stuart Wortley's Report on Photography is short, as the Exhibition in this department was meagre. He congratulates the world upon the fact of his favourite pursuit "having now won its way so far as to be classed among fine arts at the series of International Exhibitions," a classification against which it behoves Fine Art to protest. He particularly admires enamel and coloured photographs, and we are sorry for him. He concludes with a hope that "in future years more novelty will be shown in the various works sent in for exhibition, and the public be thereby led to feel increased interest in the display"—to which we have no objection, provided the "art" be kept within its legitimate bounds.

PEDESTALS.

By THOMAS MORRIS.

(Continued from page 367.)

THE tardy adornment of London with impressive monuments, notwithstanding a degree of wealth that must long have made them of easy accomplishment, shows the absence of any strong national bias for parade. Military exigencies demand the highest quality of personal sacrifice, and gratitude for its successful display is naturally intense, but Mediæval London seems to have contained few public testimonials. Our fathers may have given to such things the utilitarian turn of market crosses, standards, and conduits; and the plumbers and pewterers may have held a more prominent place among ornamentists than is now accorded to them. Some old fountains of lead remain, and certain equestrian statues are understood to be of that metal. London's first colossal column was the memento of one event graver and more appalling than defeat in arms, yet leading to new-conditions that as much surpass in benefit the most eminent victory. It is not like that at Stamboul, a burnt pillar; but the memorial stone of a burnt city. Archaeologists carry London's history back into the shades of time, but as a grand capital, she is two centuries old; no more. Old

London was a town of wood and thatch, stagnant filth, and reeking open sewers. She was the seat of plague, infirmity, and many strange and banished forms of death. The Monument, begun in 1671 and finished in 1677, is conceived upon the Roman model, and with a large degree of Roman boldness. It is the largest and loftiest example of the kind. Trajan's column, built A.D. 118, is twelve feet in diameter, and one hundred and fifteen feet high, to the top of the capital; while the London monument is fifteen feet in diameter, and a hundred and seventy-two feet high, to the same part. In lieu of gigantic blocks of marble Wren had to employ ordinary pieces of Portland stone, and to satisfy himself with shallow flutings instead of the elaborate sculpture of his model. Instead of the imperial statue, he presents an allegorical *pot de feu*. In the loftiness and proportion of the pedestal he succeeded to admiration, and the sculptural treatment of a single side by Cibber indicates the proper treatment for the rest. Like the work of Apollodorus, that of Wren is injured by the rising level of the streets, especially the approach to London-bridge; but the danger of further inhumation is removed by the fact that the quays of Thames-street are considerably lower than Monument-yard. Founders of riverside cities should, however, consider that there must be a level roadway over the stream at a sufficient height for the navigation, and within its extremities the land should be dealt with as foreshore applicable to temporary uses, but unfitted for the seat of monumental erections.

At the dawn of the nineteenth century Great Britain was surrounded by circumstances that demanded all the prowess of her sons, and high rewards attended distinguished services by sea and land. But the larger modern spirit of urban improvement had not been so far developed as to admit, in busy haunts and public ways, the likenesses of great and earnest men, whose lives, whose deaths, had been marked by devotion to the State. The modern effort is to make the town incite the morals of the people, and to constitute an open temple of popularity. Let whomsoever be a son of Fame—

"Build him a pedestal and say, 'Stand there,
And be our admiration and our praise.'"

The pedestal is thus made a platform of honour, a post of worship and respect.

The signal services of the British fleet in the wars of his time, and his own most brilliant career, gave Viscount Nelson prominent claims on his country's gratitude, and a bolder expression of this sentiment was desired than would be compatible with the interior of any edifice whatever. There were already the sepulchral monument in S. Pauls, and the honorary work in Guildhall, a hall that would be improved by the removal of its marble furniture. The result of a competition in which many designs of great merit and diversity of form were submitted, proved the general preference for a columnar figure, among the more important causes of this preference being the power of the column, by its characteristic attitude, to impart dignity to the immediate composition in which it is employed, to constitute an agreeable visual focus, and to impede in a minimum degree other objects in the same *coup d'œil*. The point was hotly contested by the artists of the day, and it was only after a second competition that the original decision was confirmed. Anything in the nature of a temple, the architect argued, was ineligible, both on account of expense and obstruction to the view; while a group of figures to keep within the proposed cost, must have been on such limited dimensions as would be appreciable on close inspection alone. A column gave opportunity for the combined efforts of the architect and sculptor, and this is a suggestion that no artist but an architect could make. The Corinthian order, the most lofty and elegant, had not been used here for a similar purpose, and a suitable example was found in the temple of Mars Utior, at Rome. The heights originally proposed were, podium 10ft., pedestal 39ft., base 9ft.,

shaft 90ft., capital 14ft., acroterium* 14ft., statue 17ft.; but certain slight modifications were subsequently introduced, and the total height brought down to about 186ft. The portrait statue of Nelson (in an attitude similar to that of the nude fragment of Hadrian in the British Museum) exhibits the veritable costume of his rank, records the loss of his right arm, and displays the aigrette presented to him by the Sultan. His left hand rests upon his sword, and the only accessory is a coil of rope cable. The late E. H. Bailey, R.A., received a thousand pounds for the work, and his grace the Duke of Buccleuch presented the Cragleith stone of which it consists. The quarrying and shipment of these blocks, for which a vessel was especially dispatched, and for which a quay had to be formed, were attended with considerable difficulty and interest. The rolling-pin illustrates a form in much favour with sculptors. It allows the free use of the cloak and affords stability and mass with little labour; history is better served by truthful representation and actual costumes than by false drapery, easily-produced effect, and sleight-of-hand. Oliver Cromwell admonished young Van der Vaes (afterwards Sir Peter Lely) to paint his picture faithfully as he saw him; and with the same regard to fact that the Nelson committee resolved that the admiral should be represented as he usually appeared. The statue therefore shows him just as he trod the deck of the *Victory*. It is a strong but not elaborated likeness, and the colossal dimension of 17ft. is simply adopted without excess to the situation.

The production of the capital was a considerable work, and one for which no precedent existed. The model was prepared by the late Mr. C. H. Smith, a gentleman of some ability, gold medallist, and life student of the Royal Academy. A portion of the bell was built up in brickwork at Mr. Smith's premises in Clipstone-street, and plastered to the exact figure of the masonry. Fully a fourth part of the foliage was there prepared and fitted with exactitude to this core. The moulding and casting were done by Mr. Clarke at the foundry of Woolwich Arsenal, and a sufficiency of old guns were obtained by the committee. The castings are fine light productions, but it was found that as the moulder saved metal he incurred expense in boxes and labour. The bronze work is attached to the stone by strong hoops of the same metal, resting in channels. From these hoops eyes or slots project, and each casting has corresponding hooks at the back, so that a firm fixing was obtained with great facility.

From the top of the abacus downwards to the pavement the column is of granite from the quarries at Foggin Tor, a kind very suitable for such work on account of its freedom from horse tooth, and the evenness of appearance. The components of mica, feldspar, and quartz, are in small portions, very intimately mixed, affording a good surface when truly wrought and finely axed as in this case. There is no parade of large blocks, but a correct principle of construction is observed throughout. The horizontal beds are slightly concave, and the joints true and square. The courses are carefully bonded, and those of the shaft are connected by slate joggles in the beds. Messrs. Thomas Grissell and S. M. Peto were the contractors, and their work is still undisfigured by a single flaw.

The podium and pedestal of the Nelson memorial possibly constitute a nobler base than was ever prepared for any other column, ancient or modern, of which accounts or representations remain, and the attention challenged by the boldness of the profile is repaid on closer inspection by the interest of the detail. In place of the continuous roll by which the wars of Rome or France were described, as the Bayeux tapestry also recites the conquest of

England, a few events in the hero's career are selected and illustrated. The engagements of S. Vincent, Copenhagen, Nile, and Trafalgar, afford subjects for the great panels of the pedestal. These subjects were embodied in the first design, and more fully drawn out in the second; but before the period for their execution arrived the original subscription fund had been exhausted, and the architect and his work transferred to the Government. Under this new patronage they were entrusted to four artists of acknowledged merit, Messrs. Watson, Woodington, Ternouth, and Carew. It was necessary to secure a general uniformity of treatment, and yet to preclude each artist in the least possible degree from the free exercise of his own mind. A preliminary conference of the architect and sculptors accordingly took place, and the several points were discussed. At this meeting it was decided that the character should be natural and pictorial. The level of the perspective horizon, if I may so speak, was determined, the size of the chief figures settled, and the representation of smoke, so probable in a sea-fight, but so contemptible in art work, disallowed. The unanimity with which this powdery attribute was thrown aside shows that no one of the gentlemen employed, nor perhaps any artist of ability at the present day, would think of repeating the "pancake monument" of Admiral Tyrrell, by Nicholas Read, sculptor, in Westminster Abbey. The result of the conference was reported by the architect to the First Commissioner, by whom it was at once confirmed and issued as an authoritative instruction. The sculptors received a thousand pounds for each subject in plaster, and the moulding and casting in bronze was separately undertaken by the Government. If any one doubts that these commissions were well and skilfully performed, or that the nation has money's worth, let him survey the work. A long interruption then occurred, and the diagonal pedestals intended for the lions seemed likely to remain unoccupied. Whether this arose from indifference to the object of the memorial, or to lack of funds, or the yet more probable want of an artist of unquestionable qualification for such a work, it grew into a source of comment, not to say national reproach. Severity, however, ought to have been disarmed by the recollection that admirable as the Greek statuary were in regard to the human subject, they are known to have been less happy in the representation of the lower animals, the horse and a few others excepted. It was better to be patient than to shut out the chance of ultimate success by the premature adoption of mere pretentious mediocrity in a work so important, and in a situation so public. The necessary combination of patronage and genius was at length presented. Baron Marochetti had, during his sojourn in this country, made many influential friends, and his studio afforded scope for the gigantic model. Sir Edwin Landseer was known to possess an unequalled acquaintance with the leonine in common with other animal forms. The very sensible impression arose, no doubt, in some high quarter that the facilities of the sculptor and the power of the painter might be jointly employed. The happy conception was acted upon, and crowned with a success altogether unapproached elsewhere. Mr. William Raitson has retired from professional pursuits, yet to him the renown of his work must afford the highest gratification. The country, however, surely owes him, not less, but something more than ordinary acknowledgment. It expects each man ungrudgingly to do his duty, and sometimes bethinks itself of the motto, *Palmas qui meruit ferat*.

"Smoke drainage" is loudly called for by a *Times* correspondent, who dilates very pleasantly on the blessings it would bring to smoke-dried Londoners, but is very hazy as to the means for its accomplishment. When the ground drainage is disposed of time and attention may be spared for something more aerial.

Great progress has been made with the works for the new Bristol Channel Docks at Avonmouth. The excavation at the docks now amounts to nearly 1,000,000 cubic yards. Mr. Brunlees is the engineer.

* The small pedestals for statues and other ornaments at the angles and apex of a pediment are called acroteria, but the gate of the Agora at Athens is the only Greek building in which they appear. Acroterium meant in a general sense an extremity or vertex, and Vitruvius applies it to a promontory (lib. V. c. 12), Glos. Wilkins' Vit.

OXFORD ARCHITECTURAL & HISTORICAL SOCIETY.

THE first walk this term took place on Saturday week, when Worcester College and Chapel and the Churches of S. Barnabas and S. Paul were visited. The members met in the Hall of Worcester College, where they were welcomed by the Provost, who gave an outline of the history of the college. The magnificently decorated chapel of the college was next visited, and the Rev. C. H. Daniel, the Vice-Provost, gave a brief history of the edifice. He described the various alterations that had been made in the chapel since that period. Mr. Scott at one time furnished a plan for the chapel, but it would, if carried out, have diminished its size one half, and have caused them to spend a very large sum of money. At a subsequent period the chapel was decorated under the superintendence of Mr. Burges. The company next visited S. Barnabas Church, which, as our readers know, has recently been erected entirely at the expense of Mr. T. Combe. Mr. Combe said that he had asked Mr. Blomfield to be present on that occasion, but his professional engagements prevented him from coming. He had, however, written a letter, giving a description of the edifice. This letter stated that a great deal of misapprehension appeared to exist both as to the circumstances under which the church was designed and the manner in which it was built. The description was divided into two parts—one comprising its construction and architectural features, and the other its internal arrangement. Mr. Blomfield pointed out that in many churches a long and narrow chancel was divided from the body of the church by a high and close screen, rendering the altar invisible and the service inaudible in many parts of the building. Our churches, he said, should be so designed as to meet perfectly all the requirements of an auditorium, and at the same time be equally well adapted for the due observance of all the rites and ceremonies, whether carried out with the highest development of ritual or in a more simple manner. With reference to the small size of the vestry, and the absence of any special chamber for an organ, which might be noticed as defects in the plan, he observed that when the church was begun, it was thought that the choir would at first be extremely small, and the addition of another vestry at some future time, if required, would be a matter of no difficulty whatever. The church was purposely designed not to admit of a very large organ, the advantage of which was open to question. Mr. Blomfield objected to its being classed with cheap churches. The work was put, without any competition, into the hands of a thoroughly good constructor, and not one single item of the design was altered in the slightest degree to reduce the cost. The church will seat about 1,000 persons, and since it was opened for public worship a campanile has been built, thus completing the design. The total cost of the edifice was close upon £6,500. Through the kindness of the Vicar, the members were permitted to inspect the collection of vestments, banners, communion plate, &c., all of which has been presented to the church. S. Paul's Church was next visited. It was erected in 1836, and the style of architecture is Grecian. The chancel of this church has been decorated.

ANOTHER "BIG" RAILWAY STATION.

IN the BUILDING NEWS of August 11, p. 96, in reviewing the new Midland Railway Station and Hotel, we alluded to the way in which engineers have been wont, during the past few years, to vie with each other in constructing works whose principal claim to notice has consisted in being "bigger" than previous constructions of the same kind. No sooner is one large-span station-roof erected by one engineer than a brother professional manages to erect one still larger. These feats in construction, though obviously exhibiting the ingenuity of their authors, seem to be striven after solely for the sake of mere "bigness;" for it is denied by competent authorities that such large span-roofs are really necessary for the exigencies of the traffic, and no one, we presume, would pretend to say that such enormous stretches of roof as those of Charing-cross, Cannon-street, and S. Pancras have any æsthetic value. These remarks have been suggested by reading in a provincial paper that "the ancient city of York is to have the proud distinction of possessing the largest railway station in England. It is to be built by the North Eastern Railway Company, at an estimated cost of £200,000. It is said that two or three years have been spent in perfecting the plans, which have now been sanctioned by the directors." If this statement is correct, we can only express the hope that York Minster will not be totally eclipsed by the "proud distinction" about to be conferred upon the city.

THE NEW LAW COURTS.

ACCORDING to promise we give details of public staircase to galleries of Strand front of the proposed New Law Courts. Having so exhaustively described the proposed building in preceding numbers, there is no necessity that we should go over the ground again. Mr. Street has not in store for himself a bed of roses. The *Times*, as before, has opened its columns to hostile criticisms of his great work, and it is not even now easy to forecast the ultimate effect of these attacks. Lay opinion, if we so express it, is pretty unanimous in its condemnation of Mr. Street's design. Such opinion, some may say, should be disregarded; but it so happens in this instance it cannot easily be so treated, as Parliament is the final arbitrator in the matter. Sir George Bowyer, in a letter in the *Times*, has not a good word to say for Mr. Street. Neither has "F. R. I. B. A.," in a letter in the *Times* on Monday last. He makes a quotation from Mr. Wyatt's address as delivered at the opening meeting of this session of the Institute, and concludes his letter with these words:—"Mr. Wyatt has thus joined in the universal condemnation of Mr. Street's design, and I conclude this letter as I began it—Can nothing be done?" The following day Mr. Wyatt has a letter in the same paper protesting against the interpretation put on his words. He says he sees no objection to the general character of Mr. Street's design, and admires much of its detail, though he "should individually have preferred to see the Strand front less broken up into different masses, and treated more like one of the Continental townhalls." On the following day "F. R. I. B. A." returns to the charge, and quotes from the official report of Mr. Wyatt's speech, and claims Mr. Wyatt among the condemners of Mr. Street's design. On the following day (yesterday) Mr. E. Welby Pugin follows suit, and in one of his iconoclastic letters finds eight primary faults with Mr. Street's design. According to Mr. Pugin, the building is inappropriate, incongruous, and altogether unhappy. Verily Mr. Street has a difficult task before him!

PROPOSED NEW SUBWAYS.

BESIDES Brunel's great work, the Thames Tunnel (now used for railway purposes only), and Mr. Barlow's much more recent "Tower Subway," it is proposed to make another subway beneath the Thames. The failure of the Waterloo and Whitehall Railway scheme has not deterred some enterprising people from giving the Parliamentary notice for the formation of a subway designated "Thames Subway," from the Victoria Embankment to Commercial-road, Lambeth. Of course the more accessible each side of the river becomes to those on the opposite side, the better; but has the formation of the subway already commenced or completed been so supported or encouraged by the public as to stimulate enterprise in this direction?

The Tower Subway (as the *Railway News* remarks) is undoubtedly a very clever piece of engineering, executed in a marvellously short space of time and at a very low cost; but here is an end of its successful features. The traffic through the subway, it was intended should be conducted by steam power, and sanguine expectations were entertained as to the almost infinitesimal degree of power that would be needed to take a light steel omnibus through. The power accumulated in descending to the middle of the passage was to be utilised in the ascent of the other half, and the speculation was even hazarded that a man, with appropriate mechanical apparatus, could exert power enough to take the vehicle home to the shaft by supplementing the accumulated power. From the first, however, steam engines were placed at the bottom of each shaft, one to work the hoists and the other to haul the omnibus. It was an application of steam under totally novel conditions. After many changes of the tackle, and much sweltering in the pits on the part of the engineers, the hoists and omnibuses, and the steam engines, were taken to pieces and hauled to the top; wooden stairs were fitted in the shafts, and passengers were allowed to pass through on foot on payment of a toll of one halfpenny each—a rather lame and impotent conclusion. The subway was not designed for foot-passage, for which the 7 ft. pipe through the London clay does not afford adequate head-

room. This defect can, of course be easily remedied in the subways of the future by making them of larger dimensions.

Notice has been given of an application for powers to construct a subway between the South Kensington Station of the Metropolitan and Metropolitan District Railways and the Royal Albert Hall. This project will probably be opposed by a new company that proposes to construct a railway between the two points named.

Liverpool has also an important subway project for consideration in the coming session. It is for a connection between Liverpool and Birkenhead by a subway under the Mersey. As powers have already been granted for the construction of a tunnel under the Mersey, close to the same locality, it is difficult to see upon what grounds this new project can be supported.

RAILWAY BRIDGES IN WET WEATHER.

THE huge trough-like bridges which carry the various lines of railway across some of the finest of our metropolitan thoroughfares are ugly in the extreme, but there is no reason why, in addition to their offensiveness to the eye in all weathers alike (except perhaps very foggy weather), they should be additionally offensive in wet weather by the operation of the water which oozes gently through the ironwork and trickles slowly over the surface. Londoners are getting used to unsightly masses of iron and stonework, but when each railway-arch becomes a sort of impromptu shower-bath at every rainfall, and bespatters passers-by with dirty water, the limits of endurance are past, and we begin to feel that something must be done. The Lambeth Vestry have discovered that complaints are useless, that body having remonstrated with the London, Chatham, and Dover Railway Company on the subject, and getting only indifference and silence for their pains. Under these circumstances the vestry have determined to take legal proceedings against the company, with a view of putting a stop to the nuisance.

ASPHALTE PAVING AND BITUMINOUS ROCK COMPANIES.

FROM a tabular statement of facts compiled by Mr. Albert Sharwood, and published by Mr. F. C. Mathieson, of Bartholomew House, E.C., it appears that, since February last, twenty-three different asphalt and paving companies have been formed in this country, with capitals in the aggregate of £3,220,000. The *Financier* says:—"Several of the companies that have been formed have been established to supply the demand in foreign countries; while here also the field of operations is wide enough to give a very large amount of employment. From Mr. Sharwood's list it appears that the various companies deal with ten different sorts of asphalt; that eight companies have been formed for working mines and quarries, and also for paving; two for importing asphalt exclusively into the United Kingdom and its colonies; six for importing and using asphalt in foreign countries; three for paving streets, &c., in London and the provinces; and two for paving in the provinces only."

BUILDERS' BENEVOLENT INSTITUTION.

ELECTION OF PENSIONERS.

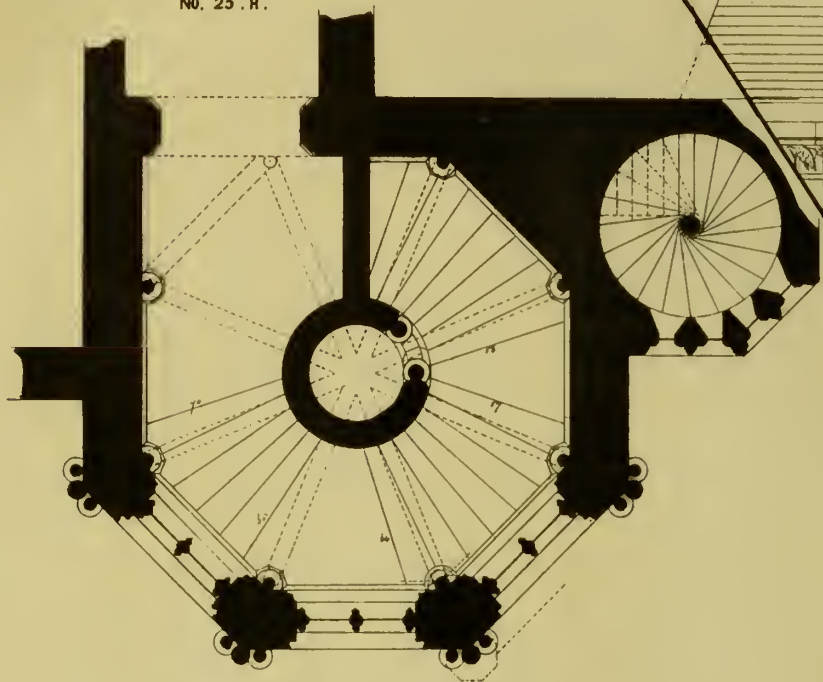
THE 36th election of pensioners in connection with this Institution took place yesterday (Thursday) at Willis's Rooms, St. James's. Mr. George Plucknett, of the firm of Cubitt & Co., presided at the commencement of the proceedings (12 o'clock), and opened the poll. There were 13 candidates (4 males and 9 females), of whom only two (one male and one female) were to be elected. The candidates were:—Francis Soudon, William Gale, Mark Mintry, Matthew Saich, Frances Seare, Ma St. George, Jaue Brothill, Elizabeth Trevethan, Ann Budd, Eliza Lambert, Arabella Hambrook, Sarah C. Bear, and Ann Williams. Including the two elected yesterday, there are now 45 pensioners on the funds of the Institution, the males receiving £24 each per annum, and the females annuities of £20. At the close of the poll (3 o'clock), Mr. Joseph Bird presided. The scrutineers (Messrs. Thos. Stirling and Matthew Hall) having announced the number of votes recorded for each candidate, the Chairman declared that Mr. William Gale and Mrs. Mary St. George were the successful candidates. Votes of thanks to the scrutineers (proposed by Mr. Thorn, seconded by Mr. Richardson, and supported by Mr. George Bird), to the vote-checkers (proposed by Mr. Stirling and seconded by Mr. Nicholson), and to the Chairman (proposed by Mr. Richardson and seconded by Mr. H. W. Cooper) concluded the proceedings.

NEW COURTS OF JUSTICE.

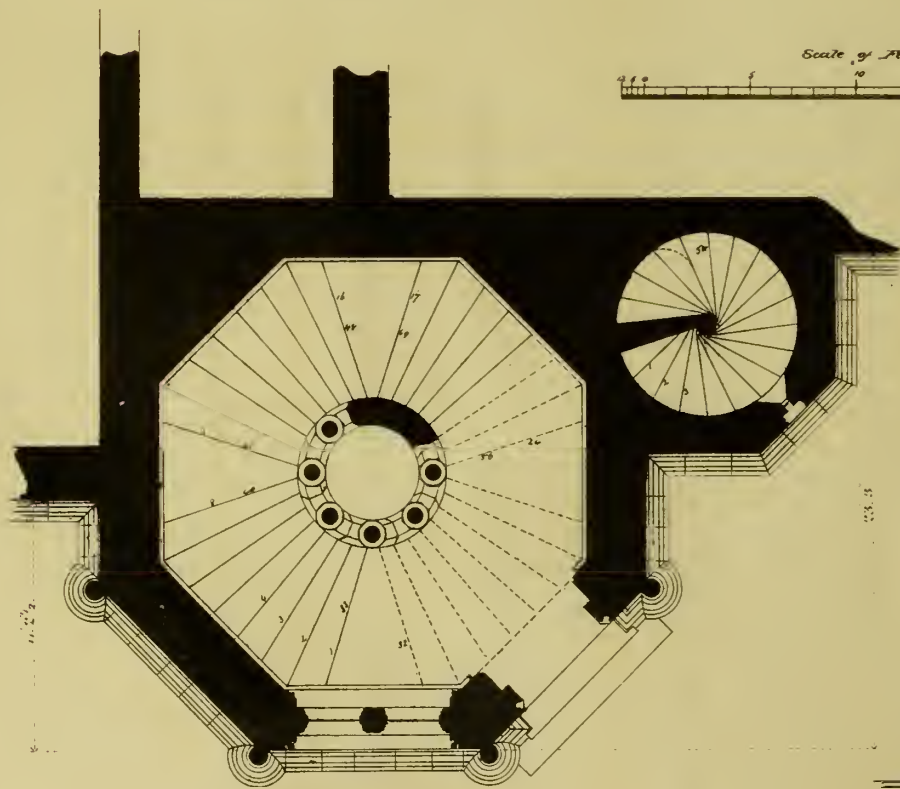
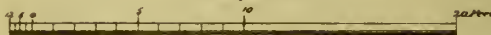
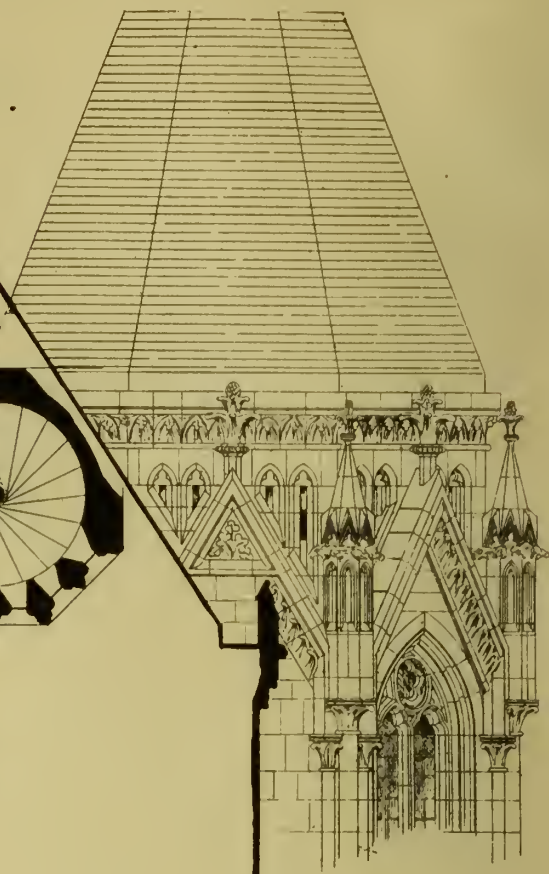
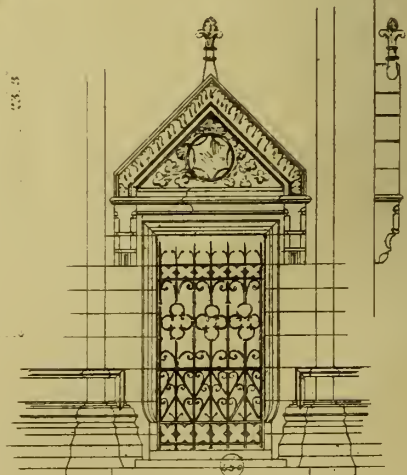
DETAIL OF PUBLIC STAIRCASE TO GALLERIES.

STRAND. FRONT:

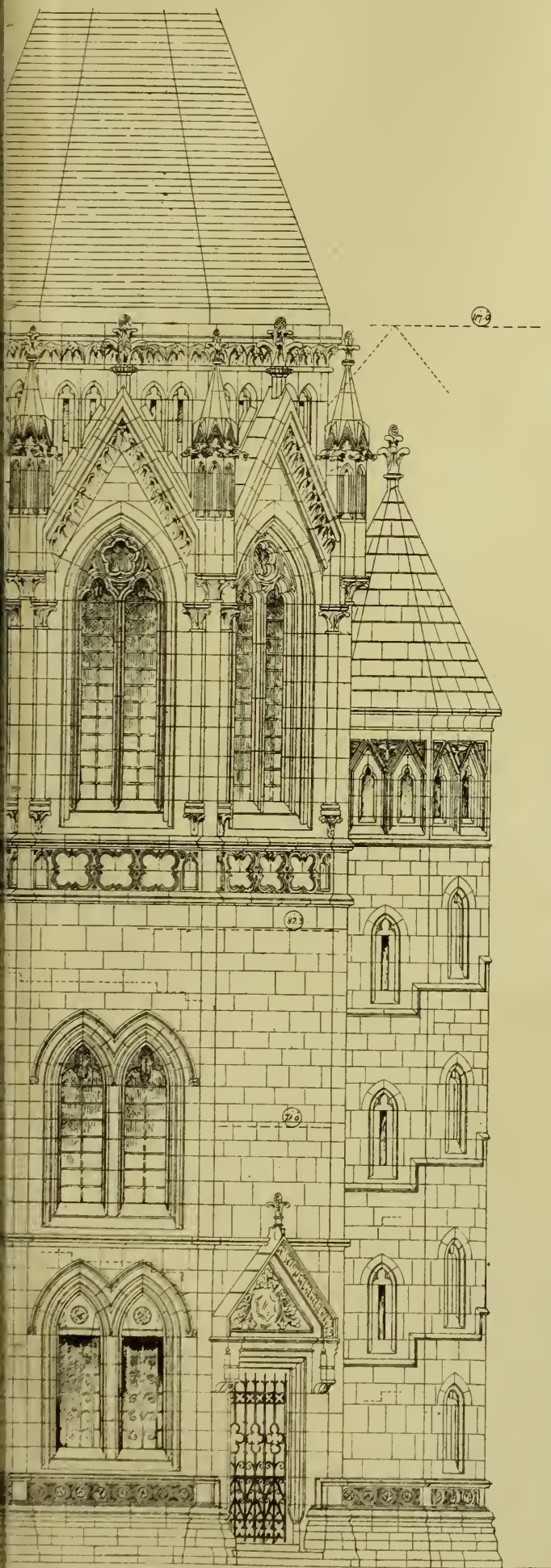
No. 25. H.

*Plan of Upper Part.*

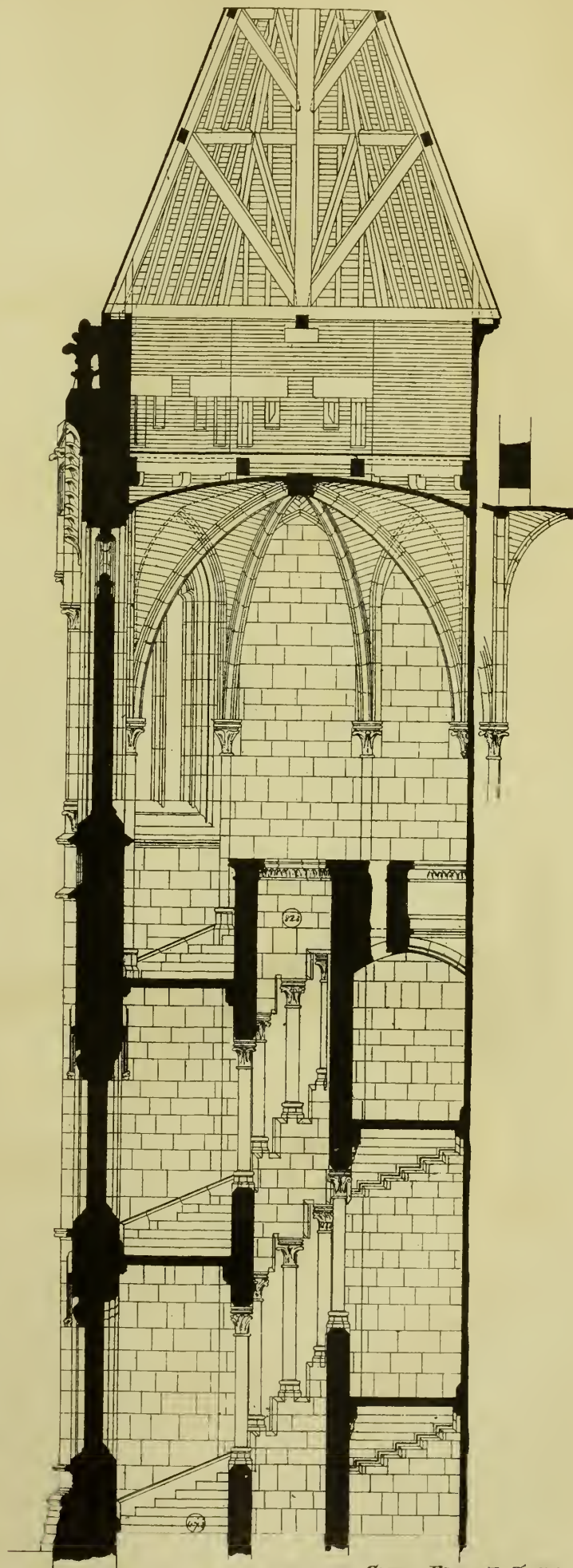
Scale of Feet.

*Ground Plan.**Side Elevation.**Elevation of Doorway.*

Dec^r 1st 1871.



Front Elevation.



Section.

George Edmund Street &
November 1871.

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THE VILLAGE CHURCHES OF DENBIGHSHIRE.*

WE have received the first two parts of the work which, under the above title, Messrs. Lloyd-Williams & Underwood, architects, of Denbigh, and Associates of the Institute of Architects, are publishing by subscription. Both the idea and method of execution are well worthy of commendation, and although the subjects treated of are, as may be supposed, for the most part simple and unpretending, yet they will be found to be by no means devoid of general as well as local interest. A record of this character of the condition of the village churches of a district, particularly one that has not suffered much from injudicious restoration, cannot fail to be of value, and will be looked back upon hereafter as an historical document, and may, perhaps, act as a deterrent to those who might otherwise recklessly destroy or change buildings which they might imagine few cared for, and were wholly at their mercy for them to modify as they pleased, without risk of detection. Hoping that the example set not long ago in the same direction by Mr. F. L. Willson with regard to the churches of

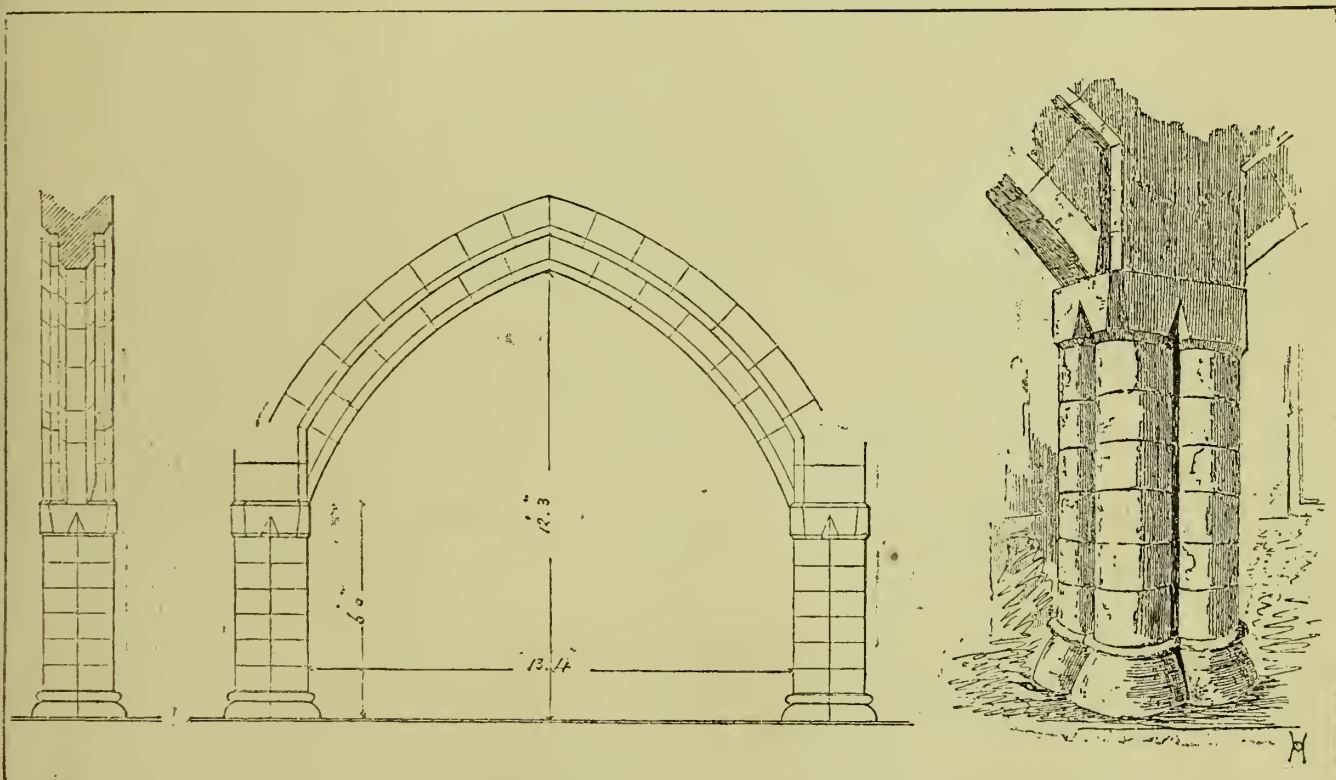
divided off internally as a "herse-house," and a vestry is attached to the west-end of the north aisle, which one would wish to know whether they formed part of the original plan or not. The only detail of interest, the roof principal, is given to quarter scale, together with a well-designed incised slab on the same plate. But to the former of these we should have been glad had the number of principals been indicated by dotted lines on the plan, or their distance apart given in writing; we presume by the scantling of the purlins there would be two to each bay of the arcade.

Llanrhaidr Church, of fifteenth century work, is of the same character, but smaller, and with the addition of a small western tower. It is interesting, say the authors in a note, on account of its fine timber roofs and a remarkably good jesse window, the glass having been preserved from destruction in an old chest, which, with its contents, was buried in the churchyard. Two great Perpendicular windows in the east-end of the two aisles are the main feature externally of this as of the last example; but, internally, the roofs, which are alike, both to nave and aisle, are really very sumptuous. Principals

being in neither case noteworthy, and the same remark applies to the two churches given in Plate 8. Might we ask why, then, they were given us? We sincerely trust we are not to have, as a species of padding, views of all the uninteresting and "restored" churches in Denbighshire. Might we not, at least, have the milk and the water sent to us in different cans, so that we can mingle them or spill one at our pleasure?

Whitchurch, the parish church of Denbigh, is now disused, except as a mortuary chapel, being at some distance from the town. Externally it resembles closely, but with the addition of a tower at the west-end, the first described church of Llanefydd; and internally, as regards its roof, but with less elaboration, that of Rhaiadr. Perhaps from the associations of its neighbourhood to themselves, the authors may, in this case, be excused what might otherwise appear unnecessary repetition.

Plate No. 6 is one, however, for which we are grateful. It represents to inch scale the "Maia-Achwynfaed," or Stone of Lamentation, an interesting and elaborated ornamented Celtic cross, probably of the eleventh



Llandisfarne, and now repeated by the authors of this work before us, may be followed in other quarters, we pass to examine the contents of these fourteen plates of it.

Llanefydd Church is the first one represented, by a ground-plan, transverse section, and perspective view. This plan is one frequent, apparently, in this as in some other districts, consisting of two parallel aisles, divided by a central arcade, and without any projecting chancel. Four other churches are given, the plan of which is the same. In Llanrhaidr and Llanfwrog Churches, the southern aisle is the nave, with the altar against the east-end; while in Whitchurch and Llanfair-Dyffryn-Clwyd Churches the northern aisle is the nave. We cannot but think that if some distinction in the hatching of the walls belonging to the various dates—or, at any rate, to ancient and modern construction—had been adopted, it would have been well. In this case—of Llanefydd Church, for instance—the western portion of the nave is

have collars at mid-height, with nearly elliptical moulded curved braces, resting on small hammer-beams, which in every alternate case is carried down by a corbelled post against the wall, decorated with a column and arched bracket, and the figure of an angel is placed at the end of the hammer-beam. Each bay between the principals is divided into three longitudinal and five vertical divisions by massive moulded purlins and rafters, intersecting with richly-carved bosses at their junctions, and intermediate slighter rafters again subdivide these square panels into two oblong ones; a rich band of traceried paneling connects the lowest purlin with the cornice wall-plate. The details of this ornamental work are given in Plate No. 3, and if some further particulars as to the method of joining the various parts of this elaborate roof had been given as well we should have been still more grateful, and venture to hope that in succeeding parts of this work this hint may be attended to. Might we also express a wish for some representation of the jesse window, that is the principal treasure of this church?

The two churches, Henllan and Llanychan, given in Plate 4, are described in a note as

century, fully described in the "Archæologia Cambrensis."

Llanfair Dyffryn Clwyd Church in itself is, but another variation on the foregoing types, but possesses a fine fourteenth-century incised slab, bearing a shield and sword suspended on a tree which on the half of the slab below the shield is rudely conventional, with an Early type of foliage, and roots resembling wrought iron hinges, but in the portion above the shield is converted into a more naturalistic character, with oak leaves and acorns. We have noticed elsewhere in Welsh monuments similar curious examples of the copying in later times of earlier ornamental details, specially at Llantwit Major, in South Wales, where upon the fourteenth-century tombs, the interlacing Celtic character of ornament has been closely copied.

In Plate 8 we are brought back again to Whitchurch, and given the roof-framing in detail, together with some valuable fragments of old screenwork, which we were glad to be able to examine, as it is only in comparison with each other that the entire restoration of any existing example could be satisfactorily carried out. In this small portion, for instance, we ourselves found an explanation in

* "The Village Churches of Denbighshire." Illustrated by Perspective, Geometrical, and Detail Drawings by LLOYD-WILLIAMS & UNDERWOOD, Associates R.I.B.A., Denbigh. Published by the Authors at Denbigh. Printed by A. Macgregor, Liverpool.

the treatment of its base mouldings, of the manner in which that portion of Llangwn screen, recently illustrated in this journal, must have been finished.

Llanfwrog Church, the subject of Plate 10, has a most interesting primitive sort of areading, of which the authors in a note say, "These piers and arches are remarkably good and effective; nothing could be better adapted or more simple for a village church." They are executed in red sandstone, probably early in the fourteenth century, and are in tolerable preservation.

We reproduce (p. 417) the sketches of this given by the authors, partly with the view of cautioning them to be more particular about the delineation of the jointing of the stonework. We should have thought in this case they would have been especially careful; yet it is evident that the springers of the arches must be wrongly represented alike in elevation, section, and perspective view, as it cannot be possible that the springers of the lower arch rim can be distinct from the upright block above the capital, as they are made to appear. and as if there were a straight vertical joint between them, or the one tenoned into the other like carpentry.

In Llanynys Church (Plate 11) a portion of screenwork, bearing the date, 1870, will attract notice for the artistic treatment of its carved panelwork.

In Plate 12 we have some good bench ends in Gresford Church choir, represented to 2in. scale, with mouldings quarter full size. Of it the authors remark that "the carving is particularly effective, and combines boldness and delicacy of execution in a remarkable degree, the figures are admirably carved." We sadly miss some plan of this work, which is of the Perpendicular period. The spirited attitude of an angel clad with feathers, as with mail, is certainly worthy of high praise. A second plate (No. 13) gives an equally valuable relic from the same structure; a monument under a recessed arch under a window in the south aisle, with a recumbent figure of a warrior in chain mail and surcoat; a row of nine shields in a band of quatrefoiled panels decorates the wall under the arch behind him. There is also another very fine slab, with shield, sword, and spear, and surface below the shield divided longitudinally, and decorated on one side with conventional, and the other with naturalesque foliage.

A small portion of an old screen from Llanfair Dyffryn Clwyd Church is the best among several bits of detail from that and Gresford Church, which form the subject of the fourteenth and last plate of those just issued.

We hope that our description of the contents of these two first parts, the cost of both of which is only 5s., may add to the number of the subscribers to a work which deserves the support of the profession.

GRANITE AND ASPHALTE PAVEMENTS.

(Continued from page 358.)

I RECENTLY wrote again to the same officials, and also to Capt. Shaw, Superintendent of the Fire Brigade, and to seven of the inhabitants of Cheapside and the Poultry, requesting their opinion as to the safety of the asphalte, which opinions, given to me in writing, are as follow:—

The Secretary of the London General Omnibus Company adheres to his former expressed opinion that no more horses fall than fell upon the granite.

The Inspector of Pavements (who has by my direction given careful attention to the pavement since it was laid) now thinks that fewer horses fall than fell upon the granite.

The Superintendent of Street Cleansing states that extended experience confirms his former opinion, and that fewer horses fall now than fell upon the granite.

Captain Shaw, Superintendent of the Metropolitan Fire Brigade, states that the heavy fire-engines of the Brigade travel upwards of 20,000 miles a year at great speed over the thoroughfares of the metropolis, and that he is convinced that there is less

danger in travelling over the asphalte than over the granite, that it is much easier for the horses and safer for heavy fast-going carriages.

The inhabitants of Cheapside and Poultry referred to are unanimously of opinion that fewer horses fall upon the asphalte; the majority, indeed, appear to be of opinion that safety is largely on the side of the asphalte.

Mr. Sacker, of No. 79, Cheapside, states that when there was granite many horses fell daily within sight of his premises. In 1870 he recorded some observations which he has supplied me with, and which are as follows:—

Statement of the number of horses that fell on the granite pavement on certain days in 1870, within sight from No. 79, Cheapside:—

Date.	State of Weather.	Number of horses that fell.
March 24th, 1870	Slight rain.....	30
" 30th, "	Fine	24
" 31st, "	Fine	17
April 5th, "	Fine	7
" 10th, "	Slight rain.....	14

Therefore upon the average about twenty-two horses fell daily on the two rainy days, and sixteen horses daily on the three fine days. But it should be mentioned that at that time the carriage-way was paved with Port Nant granite, which, under many years' wear, had become very slippery. Moreover, it should be remarked that the observations were on selected days, and therefore the average cannot be taken to apply to longer periods of time; and it must also be mentioned that Mr. Sacker made the observation with the view of forming opinion as to the expediency of patenting an invention.

Colonel Fraser, representing the Police, is of a different opinion from the other persons referred to, thinking the asphalte less safe than the granite, and states that 201 horses were observed by the police constables to fall in 36 days between the 6th of January and 12th of February of the preceding year.

As no observations were recorded by the police of the accidents upon the granite pavement, actual comparisons cannot be made, but the recent observations which Colonel Fraser has kindly supplied me with, are valuable, and it is desirable to see how far they support the opinion that asphalte is more slippery than granite.

Of the 36 days referred to, I find that—

On 6 days of heavy rain	15 horses fell, or 2.5 per day.
16 " slight " 112 " "	7
14 " fine weather 74 " "	5.28
36	201

The average of the 36 days gives about 5.3 horses per day as falling throughout the whole length of Cheapside and the Poultry.

From observations made for the Commission, it appears that the average number of horses which pass through the Poultry during each week day of twenty-four hours is about 13,000; and through Cheapside, west of Queen-street, about 16,000. As the numbers differ at the two points on the same line of thoroughfare, a general average can only be taken; but making due allowance for the difference, and for the diminished traffic on Sundays, the mean number of horses which pass daily during an entire week would be about 91,000, and if 201 horses fell during thirty-six days, it shows that one out of every 2,323 fell.

It is recorded in the annals of the engineers of the Ponts et Chaussées of France that the municipal authorities of Paris made observations for two months in the Rue de Sèze, which was paved with stone, and the Rue Neuve-des-Capucines, which was paved with compressed asphalte, and found that in the first named street one out of every 1,308 horses fell and in the latter one in every 1,409 horses fell, the comparison as to safety being slightly in favour of the asphalte.

The proportion of horses which fell in Cheapside and Poultry is therefore less than in Paris, and, looking at the climate of London and the more frequent moisture of the surface, the result is somewhat surprising, but both streets have undoubtedly been kept very clean during the hours of the greatest traffic.

Now Cheapside and the Poultry had been opened to the traffic eight months, or 243 days, upon 16th June last, during which time, according to the Registrar-General's returns, 137 days were fine, and upon 106 days rain fell in sufficient quantities to be registered by the rain gauge, but of the days recorded as dry, there were many upon which the rail fell in

such small quantities as not to affect the rain gauge at all, but nevertheless sufficiently to make the surface of the asphalte moist; indeed, the past eight months were very remarkable for small quantities of rain falling at frequent intervals, which is exactly the class of weather to make asphalte slippery, and the whole of the period may therefore be regarded as having been unfavourable to the asphalte in this respect.

Looking, therefore, at the almost perfect unanimity of opinion of the officials consulted, as well as of the inhabitants in Cheapside and the Poultry; at the number of horses that fell according to the police returns, and their proportion to those that passed through the streets; and at the relative proportion of the accidents to those observed in Paris; and also considering the character of the weather during the past eight months, there seems reason to believe that upon the average, no more horses will fall upon asphalte than upon granite if the streets are adequately cleansed.

There are consequences, dependent upon slipperiness, which should be noticed.

Horses which have fallen get up with more difficulty than upon granite, but a handful of sand or a horsecloth thrown down remedies this, and if asphalte pavement is much extended in the metropolis, drivers will find out what is essential to meet such casualties, and will provide accordingly.

The opinion expressed by me last year, that when horses fall upon asphalte, they are less liable to injury than upon granite, has, I believe, been verified; from all sources I hear that they are usually but little hurt, and generally not hurt at all.

Captain Shaw states that the horses of the Fire Brigade have fallen upon the asphalte, and often fall upon the granite. That when they fall upon granite they are usually more or less cut or injured, but of those which have fallen upon asphalte not one has hitherto been injured in any degree.

If himself, constantly driving with speed, thinks that when horses fall on the asphalte it is because they are unaccustomed to it, and when leaving the stone are startled "at the strange sound of their own feet, the sudden slackness of the traces, and the noiselessness of the engines or the carriages which they are drawing."

This timidity of horses indeed is noticeable, whenever they pass from granite to wood, or from wood to granite; or, indeed, wherever there is any change in the material of the road surface, and hence small detached areas of asphalte are more likely to cause accidents than greater areas.

Horses heavily laden have more difficulty in starting than upon stone, for they miss the foothold which the joints afford; but this is also, to some extent, owing to their being unaccustomed to the asphalte. They usually start, moreover, with a violent effort, stimulated thereto by the driver's whip and voice; but to a fairly-laden horse, slower action with less effort would, on asphalte, accomplish all. Nevertheless, for the exertion of much strength in traction the smoothness of the asphalte is less fitted than granite pavements.

Carriages, it has been thought by some, travel more slowly over asphalte than over granite, and I have myself been under that impression. If they do so, it may be attributable in a degree to both horses and drivers being as yet unaccustomed to it, and more care is certainly necessary in driving over it in such thoroughfares as Cheapside, because, the draught being so easy, there is more difficulty in stopping a carriage than upon a pavement with joints; and danger would therefore arise if vehicles moved with much speed; but late at night, and when the roadway is clear, they appear to me to travel over it quite as quickly as they do over ordinary pavements.

Captain Shaw states that the drivers of the fire engines slacken speed momentarily upon going on to the asphalte, just as they do when entering upon a granite pavement, after leaving a macadamised road; but that, directly the horses are accustomed to the pavement they resume their usual speed.

Nevertheless, I do not think that asphalte is under an average of conditions so well adapted for rapid travelling as granite or macadam.

Upon careful consideration of the various facts and opinions brought under my notice, as well as from much personal observation, I have no doubt that compressed asphalte, in a proper condition of cleanliness, is not upon the average more slippery than granite, but that there are times when it is much more slippery; that horses falling upon it are less injured, but have more difficulty in getting up; that if asphalte is extensively laid down ordinary travelling upon it will be as expeditious as upon granite, but that speed must be slackened in streets where there is much traffic, or where it may be needful to stop suddenly; and that it is less fitted for

great speed, and for exertion of strength in drawing heavy loads.

The short time the Limmer asphalte has been laid has afforded no opportunity for observing whether it is more or less slippery than compressed asphalte; but, inasmuch as it is mixed largely with grit and sand, it should theoretically, by causing more friction, be less slippery. This will also apply to the Val de Travers liquid asphalte.

Barnett's liquid asphalte having also much grit incorporated with it, will afford a similar surface to that of the Limmer; and the patentee considers that the metallic ingredients in it will, by oxidising, still further diminish slipperiness, and this may possibly be the case. The experiment about to be made with this and the Limmer asphalte in Moorgate-street will in time set the question at rest with regard to both of them.

CLEANSING.

It is essential to the safety of the traffic that asphalte should be kept cleaner than granite, and indeed should be kept very clean.

The surface being unabsorbent and without joints, is not only unfavourable to the accumulation of dirt, but offers more facility for cleansing than granite, whatever mode may be adopted, for that purpose: for the broom, the scraper, the shovel, or water, can be applied to it more effectually than to any pavement with joints; indeed no other pavement can be kept so clean by any process whatever as asphalte.

It was found more easy to clear it effectually of snow during the past winter than any other pavement in the City.

The best mode of cleansing it is by the street-orderly system, combined with a morning sweeping and occasional washing, and this is the mode now adopted. For carrying out the system, iron bins have been placed at intervals along the footways, to receive the refuse which the street orderlies collect so soon as it falls. When it rains sufficiently, they sweep the surface towards the kerbs with squeegees, and the water runs into the sewer, where it is harmless. This system diminishes the labour of the morning cleansing, which takes place before the street orderlies begin their work, reduces the cartage, leaves the manure collected of a higher value than that from streets swept but once daily, and maintains the asphalte in a state of cleanliness unattainable in thoroughfares paved with any other material. Small stores of sand are placed at each bin for strewing the asphalte when slipperiness occurs, and the superintendent of street cleansing states that the quantity of sand used at first was considerable, but that it has been since greatly diminished, as experience shows that a very small quantity suffices for the purpose.

The high state of cleanliness renders street surface-watering unnecessary; and this is in itself an advantage, for street watering is only resorted to to prevent nuisance from the dust, and converts the dust into mud, which is also a nuisance.

The cleanliness causes more expenditure for labour during the day, but taking all circumstances into account, the superintendent considers that the expense is not materially higher than that incurred for other pavements in main streets of the City.

The freedom of asphalte from dirt after being newly laid or repaired is another advantage, which will be referred to under the section of "formation and repair."

FORMATION AND REPAIR.

The Val de Travers compressed asphalte in Cheapside and the Poultry has an area of 7,854 yards, and was completed, with the foundation, in 58 working days. Old and New Broad-streets, containing 3,671 yards, were completed in 24 working days. The average of the two gives about 140 square yards laid per day. A new granite pavement could be laid in less than half the time.

The company considers that, as their system becomes established, they shall be able to do the work more quickly; but, inasmuch as it is necessary to wait until the concrete is dry, it does not appear to me that it can be laid much more expeditiously, however good their future system may be; if, however, the work be a mere renewal of the asphalte surface only, then there is no reason why the work should not be done at least as quickly as granite.

Small surface repairs can be made more expeditiously than in granite; and the reparations, where there is much traffic, can scarcely be discerned in a week or two afterwards. They are also effectual; but repairs in granite are rarely satisfactory.

Over deep excavations it has been found at times, necessary in Paris to fill in the surface with hard material, and not to allow the traffic to go over it until it is consolidated; the concrete is then made good, and the surface restored; and either this must

be done here, or the asphalte be more than once repaired. Granite pavements are usually relaid twice, and sometimes thrice, over openings; so that they have no practical superiority in this respect.

Compressed asphalte cannot be well laid or repaired in wet weather, for, although the Company have movable coverings, to enable the work to be done under them at such times, yet in this climate there will be practically much difficulty in employing them usefully, and I believe that the work will have to be discontinued generally when the weather is not reasonably dry.

Granite pavements cannot be so well laid in wet as in dry weather, but they are not so dependent upon the weather as asphalte, inasmuch as the stones can be laid in their places whatever the state of the weather may be.

Compressed asphalte can be laid and repaired during the winter, provided the weather be dry and not too severe. Granite pavements cannot be laid or repaired effectually during frosty weather, for the grouting freezes.

Compressed asphalte, when laid, is fit for the traffic a few hours afterwards. It is left perfectly clean, and creates no inconvenience either to the traffic, or to the inhabitants; but the carriages must be allowed to circulate freely over it when first used, as, until it is somewhat compressed by the traffic, the wheels of vehicles which stand long upon it leave impressions. Liquid asphaltes are ready for traffic as soon as they are cool, and are not injured by vehicles standing upon them.

Granite pavements, when laid new, are covered with fine gravel for from one to two weeks afterwards, during which time, according to the state of the weather, there is either mud or dust, and, therefore, much public inconvenience. The smallest repARATION is gravelled in a similar manner with a similar result. This dirt is carried by the traffic far beyond the surface laid with it, and even into adjacent streets; and it is the dread of the Superintendent of Street Cleansing, for it renders cleanliness impossible, whilst it increases the expense of the work. Some of the grit also falls into the gulleys, causing further inconvenience and expenditure for its removal.

Pavements having the joints filled with asphaltic compositions do not require to be strewn with gravel, and do not therefore cause the inconvenience referred to.

Openings can be made for gas, water, and other purposes, with the same facility in asphalte as in granite, but in granite a width of about eighteen inches all round an opening has generally to be taken up and relaid, whereas asphalte can be cut out to the exact size needed, and no more has to be repaired; and the openings being less, the public suffers less inconvenience.

The cost of repairs over openings in the asphaltes is to be 5s. 9d. per square yard; that of granite, including a small percentage of new stone and all contingencies, is very considerably less. Repairs of asphalte are, therefore, more expensive.

The price for repairs, it will be observed, is much smaller than that for the new asphalte, which appears anomalous. The Company thinks that many openings will not be made, and hitherto such has been the case; it also utilises the asphalte removed, by converting it into a liquid asphalte for footpaths, and this, in some degree, may account for the difference in price.

It must also be taken into account that a sum has to be paid to the Company for the maintenance of the asphalte for fifteen years, calculated over the whole surface, and as repairs or restorations in asphalte are practically so much new work, there is something like double payment for work over openings.

As to the Limmer asphalte, it took 28 days to lay 1,653 yards, with the foundation, in Lombard-street, or at the rate of 60 yards per diem; but the weather was very bad throughout, and the asphalte was principally laid at night. Barnett's asphalte can be laid probably at about the same rate as the Limmer, the Val de Travers Liquid, the Seyssel, or other asphaltes which require liquifying by heat.

All liquid asphaltes, under present arrangements in London, need cauldrons and firing on the spot, however small may be the work to be done; but with thought and skill great improvements may be made in this respect, and also as regards expedition and the absence of smell.

The smell from asphalte when melting, although believed not to be unwholesome, is considered by some to be a nuisance, and this induced the Limmer Company to do their work at night. The Val de Travers compressed asphalte, when brought to the work heated, has comparatively but a slight smell.

Liquid asphaltes are subject to the same difficulties in formation or repair, in frosty or wet weather, as the compressed asphalte.

Upon the whole, I think that compressed asphalte cannot be laid down with a foundation so expeditiously as granite, but that the asphalte surface can be laid quite as expeditiously; that it cannot be so well laid in wet weather, but can be laid in winter when granite cannot; that the work can be done with as little public inconvenience, that it can be as readily opened and restored, and that it is free from some of the inconveniences incidental to granite pavements grouted with lime; but that the expense of repairs will be greater, and also that asphaltes laid in a liquid state present the advantages generally in a somewhat less degree.

DURABILITY.

The duration of pavements as it affects their cost has already been considered. But durability is also a question of public convenience, inasmuch as those pavements which most frequently need renewal or repair are most frequently in a bad condition, cause more interference with the public traffic, and are therefore not so desirable as those which need less repair.

It has been stated to me by the Val de Travers Company that at Paris none of the carriage-ways laid by them have as yet needed entire renewal of surface; but from observation and inquiry made there I incline to the belief that those which have been down many years have been practically renewed by frequent reparation.

But should they even have endured so well at Paris, the material still needs the test of the severe traffic of the City of London, and I believe that the contract term will not pass without the whole being renewed, at least once, especially as the Company is bound to leave the pavements at the end of the term in as good a condition as when new.

Numerous small defects were noticed in Cheapside and the Poultry within a month or two after the asphalte had been laid; and similar defects were noticed in other pavements of the Company; but I think not to the same extent. The Company states that they are invariably found in the new work, that most of them close up under the traffic, and that the rest are repaired. Good reasons have not been assigned for these defects, which may result either from alien substances being mixed by carelessness with the asphalte, or perhaps by moisture on the foundation when the asphalte is laid.

The defects were, as regards the traffic, of no practical importance; they disappeared and scarcely any were repaired; they therefore must have filled up by compression of the contiguous asphalte.

In April last a block of granite weighing 17½ tons was carried on a four-wheeled trolley weighing about three tons along Cheapside to the new Post Office in S. Martin's-le-Grand. The weight on each wheel was therefore about five tons, yet they left no impression upon the asphalte; the felloes of the wheels were wide.

The asphalte pavement in Threadneedle-street has been down twenty-seven months, and shows but slight signs of wear at places. The granite pavement laid to the east of it, which has been down nearly the same time as the asphalte, is much cut and worn upon both edges of the trams, and must be repaired this year; but the street is narrower where there is granite than where the asphalte is laid.

In Cheapside there are signs of wear next to the kerbs, at those places where the carriage wheels take closely the same line. There are also in a few places small depressions in the centre of the roadway, which are not the result of wear, for there are no specially destructive influences at those spots, and they may be attributed, therefore, either to faults in the foundation or defects in laying the asphalte. One bad place, seemingly attributable to defective work, near Newgate-street, has recently been repaired.

In the Poultry there are depressions on both sides next the kerbs, throughout nearly the whole line of street, the result of the wheels travelling in exactly the same track; and there is a very bad one at the angle of Queen Victoria-street, where the wheels twist in turning round towards that thoroughfare, and those ruts will probably need repair before the winter sets in; but there are no surface indications of wear generally either in Cheapside or in the Poultry.

All granite pavements in the Poultry, for many years past, either next to the kerbs or next to the tramstones, needed repair at about the end of the first year, excepting when laid with Carey's toothed trams.

(To be concluded.)

The Church of S. James, Ntley, Sussex, which has been enlarged by the addition of a north aisle and vestry, under the direction of Mr. W. Maynard Shaw, architect, was lately opened by the Bishop of Chichester.

Building Intelligence.

CHURCHES AND CHAPELS.

ASHBURY.—The restoration of the parish church of Ashbury, North Devon, has been completed, with the exception of the nave-seating, pulpit, altar, and stained glass, and it will be reopened in the spring. In consequence of the very defective condition of the walls, the whole had to be rebuilt. The new chancel arch, east window, credence steps, and inside arches to windows and doors, are all of Hatherleigh stone. The tile floors are from the works of Messrs. Maw. The interior of the tower has been thoroughly cleaned out and repaired, and a new ceiling of oak placed over the belfry. The leading feature in the carved and encaustic tile work is the lily, the emblem of the Virgin Mary, to whom the church is dedicated. The church, externally, presents a picturesque effect, the warm tone of the Hatherleigh stone copings, crosses, and windows contrasting well with the gray walling and the foliage by which the church is surrounded. The works were entrusted to Mr. Dendle, contractor, of Barnstaple, and the whole has been carried out from the designs and under the supervision of Mr. John F. Gould, of the firm of Gould & Son, Barnstaple.

ELPHIN.—The new (Roman) Catholic Cathedral at Elphin, Sligo, is progressing satisfactorily towards completion. The building is of Lombard or Norman character, consisting of nave, aisles, transepts, semi-circular apse with aisle passing round, and apsidal chapel beyond; and two chapels of the same form in the transepts. A massive lofty spire rises at the western end of the nave. The total external length of the building is 219ft. 6in.; the total external width across transepts is 121ft. 6in. The width of nave and aisles is 66ft. The massive tower, flanked by staircase turrets with stone roofs, is 30ft. square, and will, with its spire, rise to the height of 176ft. The walls of nave and apse are supported by twenty columns. The total height of the interior of the church—and this will be one of its most striking features—will be 82ft. from the floor level to the ridge or point of roof, while lofty triforia will adorn the aisles, and look down serenely on the floor beneath. The ceiling will be richly groined with moulded ribs. The ridge outside will be surmounted with ornamental cresting four feet high, while suitable crosses surmount the gables. The massive door, 10ft. wide, with its arch, is supported by limestone columns, while the tympanum will be filled with figure carving. Of the ninety windows of the new cathedral seventy will be of stained glass; most of these will be memorial windows. The whole of the work is being done by a local contractor, Mr. Clarence, from the designs of Mr. Goldie.

FORRES.—On Sunday, 26th November, a new United Presbyterian Church was opened for public worship. The building, which is said to be one of the most elegant in the north of Scotland, cost little short of £3,000. It is Gothic, with nave, transept, and side aisles, covering an area of 80 by 60 ft. The collections made during the day in aid of the building fund amounted to £330 17s. 6d.

PERTH.—S. John's Free West Church, erected by the Free West congregation, Perth, was opened on Thursday week. The church was designed by Mr. John Honeyman, architect, Glasgow, and in the English Early Gothic style. It is oblong in plan, and the pulpit and platform are placed at the west end, partly within a recess. The tower and spire rise to a height of 212 feet. The cost is about £8,000.

TUNBRIDGE.—The memorial-stone of a new Baptist chapel was laid at Tunbridge on Wednesday week. The chapel will be in the Gothic style, the architects being Messrs Searle & Son, of Bloomsbury, London, and the builders Messrs. Powell & Everest, of Tunbridge. There is to be accommodation for 400 persons. The walls will be of red brick with white bindings, and the interior will be 52ft. 6in. by 34ft. 8in., with a large vestibule on each side, adjoining which will be two vestries.

WALWORTH.—On Tuesday week the Bishop of London consecrated the new church of All Souls', Grosvenor-park, Walworth. The church is of plain brick, with Bath stone dressings, and is harmonious in its proportions. The extreme length is 125ft., the nave and aisles being 85ft. long internally. The nave roof is 54ft. high from the floor to the top of inside boarding, and is open-timbered, the external height to ridge of roof being 60ft. The interior walls are faced with white Suffolk bricks, the wall over the nave arcade being built of terra-cotta blocks with stamped diaper pattern on the face. These blocks, which are a revived form of the ancient Moorish bricks, were manufactured by the Whit-

wick Company, Leicester. The spandrels of the nave arches are intended to be filled in with ornamental tile paintings of the Twelve Apostles. Two of these are already promised. Over each stone pier supporting the nave arcade are eight figures of angels, carved by Mr. Plows. As the church will be nearly completely surrounded by houses, the lighting is effected principally by means of twelve lofty triplet-lancet windows in the clerestory. The chancel, consisting of choir and sanctuary, is 35ft. deep; the choir, which is 23ft. deep and 20ft. wide, being immediately beneath the tower, which rises to a height of 100ft. above the ground level. About 800 sittings are provided on the ground floor, and there is space for 200 more in chairs. The builders were Messrs. Henshaw & Co., whose contract was £7,700, and the architects are Messrs. Henry Jarvis & Son, of Trinity-square, Southwark.

BUILDINGS.

BATH-LANE SCHOOLS, NEWCASTLE-UPON-TYNE.—The formal opening of the Bath-lane Schools took place on Friday, the 24th ult., at which Mr. Miall, M.P., delivered an address on education. They are in the Early Gothic style of architecture, of simple character, and built of local stone, with ashlar dressings. Accommodation is provided for 600 children, at a total cost of about £3,000. Mr. Thomas Oliver was the architect; Mr. Henry Andrews the Clerk of Works; and Messrs. N. & R. Reed and Messrs. J. & W. Lowry, the contractors.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

RECEIVED.—T. R. G.—W. W.—J. C.—J. H.—T. C. H.—T. B.—S. B. A.—C. B. A.

PLANNING HOUSES.—L. H. T.—Your suggestions have been made previously by others. The suggestion that each competitor should pay a fee which should go towards paying an umpire is impracticable.—M. R.—What you suggest would be done as a matter of course.—RUSTICS.—Your suggestion about allowing each competitor a certain space for description to accompany plan will be adopted.

RICHARD JAMES.—The "Sketch-book" in reality consists of 58 plates: one of them, the frontispiece, is not numbered, and another of the plates is a double one and counts as two.

Received Drawing of British School, Warrington.

Correspondence.

THE NEW COURTS OF JUSTICE.

To the Editor of the BUILDING NEWS.

SIR,—During the time when the critics of Mr. Street's designs for the New Law Courts were so furiously raging, the pages of the BUILDING NEWS were conspicuous by the absence from them of remarks either condemnatory or laudatory on what were then to most of the profession unknown designs. The majority of us had seen the original drawings of Mr. Street, but during the long interval since their publication, it was possible only for a select few to know to what extent such designs had been modified. When, however sir, you did speak, we were favoured with such an exhaustive and minutely-detailed description of the whole structure, that if we were not masters of the subject, the fault did not lie at your door.

Of course before seeing the drawings we could not impress ourselves with the unqualified perfection of the work that evidently took possession of your critic. In fact, in the face of such comments as were bestowed in the several articles in your journal further criticism seems quite uninvited, and one cannot help feeling the impertinence of endeavouring to disturb such an unusual quality as you indicate pervades the whole building and which till now one had supposed to be obsolete—viz., *perfection*. What room is there left for a word in the presence of the statement that "the plans for the disposition, the arrangement, and the adjustment of all the parts of the whole building have been elaborated to a degree that may be pronounced almost incapable of further improvement," and then to be made acquainted with the satisfactory information that "every window that ought to be open will be found both to open and

to shut in a manner that will leave nothing that can be desired." After reading such startling sentences one could not help looking forward with the very liveliest interest to the time when you should publish the designs on which they were based. And we were rewarded last week by a photo-lithograph of a portion of the design for the Strand front; the most important front of the building, embracing a length of about 300ft., or a little more than half of the total length.

Now we can all appreciate the immense labour the thought, and the skill that must have been brought to bear on the work to produce such a design as Mr. Street has completed—he has had plenty of time to improve or to modify, as it seemed to him good, his original design; and now that part of the result of all this is before us, it is with the greatest disappointment, for my part, that I contemplate it. I had paid but little attention to the ravings of Mr. E. W. Pugin, the old-fashioned notions of Mr. Sydney Smirke, the valuable criticism of Mr. E. W. Godwin, or to the gentlemanly remark of Mr. T. H. Wyatt, at the opening meeting of the Institute, but preferred rather to wait and judge for myself. I now see the force of the last-named gentleman's utterance, that the Strand front was, in his opinion, a little too much broken up—it is indeed broken up—it is all in pieces! In the same story we have large lights, middling lights, small lights, and infinitesimal lights. String-courses drop about in a marvellous manner, until one gets quite confused in looking at the drawing; the general effect seems to be similar to that which would be produced if a collection of designs for chapels, schools, and cathedrals, had been pasted together to form one elevation; and the fact of the windows being only in the exact positions where they are required can never atone for this treatment. I have always understood it to be the aim of an architect to get a good plan, and at the same time never to lose sight of the importance (particularly in such a case as this) of grandeur in the elevation. The absence of either nobility or importance in this design is most marked, and this will be more conspicuous when in the execution there will be 60ft. between the line of the front and the south end of the Central Hall; this feature will then lose much of the importance it possesses on the drawing. By placing a piece of paper over this end of the hall the effect will be readily seen, for we cannot consider the southern end of the Central Hall as part of the Strand front; it is placed too far back to be so.

In the concluding sentence of your opening remarks on "The Plans" you speak of the "eminent ability displayed in his *strictly secular* application of the Gothic style by Mr. Street in his designs for the New Law Courts." I cannot see how that statement could be substantiated. Is there nothing about the extreme western block that we have seen in churches? Do the octagonal towers on either side of the outer entrance stand innocent of cathedral inspiration; and the outer entrance itself, is that *strictly secular*?

The Central Hall, with its traceried window, its gable, circular window, and flanking towers, what style is this? it is simply ridiculous to ask us to swallow such information. If, as you invite us to do, we take the design piece by piece, and carefully and critically examine it, my opinion is that there is scarcely a feature in the 300ft. of elevation that is not, correctly speaking, ecclesiastical. The heads to the public staircase entrances are certainly secular; they are of the Queen Anne domestic type, and by no means beautiful. One really cannot feel that this design when executed will reflect credit on the age in which it was produced; it will never cause to rise those emotional feelings of pride with which we contemplate the Houses of Parliament. Useful the building will no doubt be; but it will not possess that dignified and noble character that such a building should possess. It calls to my mind a musical composition by one little acquainted with music, a mere medley of notes placed just where fancy indicated; a crotchet under, perhaps, the now old-fashioned breve, with a few demi-semi quavers promiscuously stuck in at the side, a quaver under a minium, and so on, without even the value of a dotted note to gradually lead from one to another, and without a rest of any kind. The effect of such music when played would be harsh in the extreme—sounds up and down, up and down; no harmony, discord everywhere, as offensive to the musical ear as this 300ft. of Strand front would be to the architectural or artistic eye.—I am, &c.,

W. W.

CHURCH BELLS.

SIR,—Your correspondent "A. E. N." ascribes the introduction and invention of church bells to Paulinus, Bishop of Nola; this is contradicted by various authors, and seems to be an error arising

from the fact of his having been bishop of that city. In one of his letters to Severus, in which he details at great length a church he had built in Nola, he does not refer either to bells or tower, thus showing that there were none connected with that structure. Paulinus was contemporary with S. Jerome, in the year 400.

The town of Nola is in Campania, and possibly bells were first invented there, as we find them called Nole and Campanæ. Some think that Pope Sabinianus, who lived about 600, and who, in conjunction with the Emperor Phocas, brought into use clocks in church towers, introduced them into the Latin church, but the exact date of their introduction seems very doubtful.

Pope Stephen III. erected a bell-tower on the ancient church of S. Peter's at Rome, and in it he placed three bells; that was about the year 780, and in 850 Leo IV. built another tower to the same church, and placed in it a bell with a hammer of gold. We are informed that in the year 865, Ursus Patricius, Duke of Venice, presented the Greek Emperor Michael with several bells, who placed them in a tower he had built to the church of Santa Sophia. It is apparent that bells were not in general use in France in the year 610, as we find that the Bishop of Orleans, then besieged in the city of Sens, so frightened the opposing army by ringing the bells of the church of S. Stephen, that they raised the siege and departed. The probable date of their introduction in England is 680, wooden rattles having been used previous to that date (see Bede), and we find general mention of bells in all Christian churches in 1023. In these days inscriptions were frequently engraved on bells, one of the most beautiful being as follows:—

"To call the folks to church in time,
I chime,
When mirth and joy are on the wing,
I ring,
When from the body parts the soul,
I toll."

They were also regarded as a protection against the assaults of the Evil One; thus we hear of the passing-bell, to clear the air of evil spirits when the soul, freed from its earthly tenement, was soaring heavenward and homeward.

"A. E. N." takes notice of the bells mentioned in Zechariah, but I think he will find in most bibles with reference columns that the meaning of the word bells is given as bridles; this seems the more likely when we take into consideration the length of the inscription engraven upon them. Bells are forbidden to be used by the followers of Mohammed. The following, I believe, are the largest bells:—The Bolshoi, 21ft. high, 18ft. diameter; The Tsar-Kolokol, or King of Bells, 20ft. high, 20½ft. diameter; Great Bell of Pekin, 14½ft. high, 13ft. diameter; Great Bell of Erfurt, 10½ft. high, 8½ft. diameter; Great Tom of Oxford, 5ft. 9in. high, 7ft. 1in. diameter. "A. E. N." will find a short but interesting account of church bells in Broun's "Sacred Architecture."—I am, &c.,

J. RUSSELL WALKER.

NOTES ON BRICKWORK.

SIR,—As "Rusticus" has taken to practical brickmaking, I do not think I can give him any better information than he will quickly learn by experience. In the article he quotes I wrote chiefly for the information of bricklayers, with the intention to give them some idea of the various methods adopted to produce the materials with which they daily work, preparatory to a more detailed description of the best method of performing their own proper work; for I hold that a workman, of whatever trade, should thoroughly know the composition and nature of the materials he uses in his trade, and I call this series of articles "Notes on Brickwork," and not on brickmaking; but I am willing to answer the questions of "Rusticus" if he will take my answers as expressions of my opinion as an engineer of some experience in the use of bricks in many different ways.

First, then, as to the fuel being incorporated with the clay either during the time of casting or tempering, which I stated to consist of sifted house ashes, "Rusticus" asks whether small coal will do in the same way, and if so what size the coal should be reduced to? I should say that small coal would not do so well, or even at all. The fine siftings of house ashes do not contain much live stuff, but a little—sufficient, indeed, to rekindle the partially-burnt ashes, and create a glowing heat within the brick without giving off any, or the smallest possible, product of combustion in the form of gas, which, if produced, must either blow up the brick or find its way out through fissures; and if all the fuel incorporated with the clay were live coal, and it were

used in the same relative quantity to the quantity of clay which is adopted when using sifted ashes, I should expect the bricks to be ruined in the process of burning. (This quantity varies considerably at different yards, but we may say that an average is about half a cubic yard of siftings to a thousand bricks, and a quarter of a cubic yard of the coarse stuff to burn them with.) Nevertheless, I conceive that if a moderate quantity of coal dust were mixed with the clay after the manner first mentioned, it would be advantageous, and would enable the bricks to be set closer together in the clamp, and not require so much small coal in the layers, as when no fuel whatever is incorporated with the clay; and in this way perhaps the total amount of coal might be reduced, which I take to be the chief object of this question; but whether the labour required to reduce the small coal to a state of dust would be repaid by the process I cannot say. It might, however, be worth while to try an experiment in this direction with one end of a kiln, and if "Rusticus" will perform the experiment I shall be glad to hear of the result. I do not, however, expect that so good a result will be produced as is produced by the use of fine breeze or sifted house ashes.

Secondly, as to the size of the pallets upon which the bricks are carried away from the moulding table to the hacks. The width of the pallet board is the width of the mould from outside to outside, and the length is an inch longer than the length of the mould from out to out. This extra length gives thumb and finger hold to the moulder, and he takes the pallet in one hand and the mould in the other, and by the sense of touch he brings the edges of both to correspond, and at the same moment turns out the green brick from the mould on to the pallet, which he places, with the brick upon it, on a couple of rails at his side, set 6in. apart, from which it is taken as fast as laid down and placed on the barrow, which, when full, is wheeled away to the hack-ground. On arriving there the man takes a spare pallet board and clips a brick between it and the pallet upon which the brick rests, and sets it in the hack on its edge, leaving air spaces between the bricks. He completes the bottom row before beginning to place the second upon it, in order to allow the first time to dry.

On one row being completed throughout the length of the hack he piles on another, and so on for ten bricks in height; but as to the height it depends on the weather and on whether the lower courses of the bricks are dry enough to resist the superincumbent weight without indentation. The hacks are about 10ft. apart, and the ground they occupy is thrown up in ridges, the barrow roads being in the furrows. The chief object in forming the hacks is to allow a free circulation of air about the bricks so as to dry them as quickly as possible, and when once they are properly placed in this respect they need no more moving before they are wheeled into the kiln.

As to the "dressing, removing imperfections, and sharpening the arrises," when partly dry this is easily done before removing them to the kiln or clamp by flattening them with a tapering board, shod with iron at the thin edge, with which excrescences are dressed off; but these do not occur when the process just mentioned is followed; it is when slop-moulded bricks are laid flat on the ground to dry for, say, half a day, or more or less according to the weather, before being turned on their edges to receive a further drying by exposure to the air, that these excrescences occur, by reason of the soil sticking to them when turned over. It is in this process that the dressing is more required.

And now, having re-perused the letter of "Rusticus," I think I have taken up every question asked, except the counting in the kiln, and if "Rusticus" counts 321 to the cubic yard that agrees as nearly as may be with my own experience.

THE WRITER OF THE ARTICLE IN QUESTION.

GATESHEAD SCHOOL COMPETITION.

SIR,—Allow me, as an architect of considerable experience in the erection of schools, to give your readers the notes made in my book, on a careful examination of the above drawings when publicly exhibited in the Town Hall, premising them by saying that of the 136 sets of drawings sent in from various parts of the country by different architects, 24 were chosen for final selection, half of which had not earned even a passing note in my book; and one I had contented myself by describing in the one word "absurd."

For brevity's sake, I will give only my notes on what were afterwards selected by the Committee, viz.:—Nos. 14, 48, 155, and 196, all by a local architect; and No. 131 by a firm in Doncaster.

"No. 14. Infants' department cloak-rooms being merely the general porch-entrance, will not work; clothes would not be safe; and class-rooms and play-ground being at the opposite side of the school-room thereto, children going from one to the other would have to cross the school twice before going into playground. Boys and girls' cloak-rooms open to same objection as to relative position to class-rooms and playground, causing too much passing and re-passing in large room, and stopping work therein. Drawings remarkably well 'got up,' and therefore likely to win, unless men practical in actual school working are the judges."

No. 48. Infants' class-room accommodation too small, being fit only for about 65, instead of 210 children as per Government plans. Cloak-room position open to objections named in plan 14 by same architect; two distinct schools are provided for infants, requiring more supervision than one. Boys and girls' departments are each in large single schools, with *thirteen groups* of desks, although Government rules fix 'five, or at most six;' cloak-room arrangements as before; drawings 'got up' same as No. 14, and open to same remark."

No. 131 to 133 were not thought worthy of any special note, so many being better in the writer's judgment.

"No. 155. Infants' school-room all in one for 480 children, less those in two small class-rooms. Entrance-porch used as cloak-room, and open to objections named in No. 14. Boys and girls each in large school-rooms, with twelve groups of desks, instead of 'five, or at the most six,' required by Government rules; class-room arrangements open to objections previously named; drawings 'got up' as before."

"No. 196. Infants' cloak and class-rooms as in No. 14 class-room much too small for use, only 10ft. wide. Other cloak and class-rooms better than the other plans by same architect, but would still require alterations to be made workable; drawings as before."

These, Mr. Editor, are the notes I made before the Committee's selection was known, and are therefore uninfluenced by it in any way. There were several plans far superior, for their practical working, to any of the foregoing, and I looked for them in vain, even amongst the first 24; so it comes to this, either the Committee of Selection, or the writer, are very bad judges of school plans, and your readers must decide for themselves whose opinion they think best worthy of reliance; that of five gentlemen chosen from a school board which has only been in existence a few months, and which is now building for the first time; or the writer, who has built many schools, and whose plans and specifications have passed the Committee of Council, without even a suggested alteration in matters of detail.

Similar competitions are now open, and many more will follow under the new Act. Will you, Mr. Editor, use your influence to prevent architects competing, unless practical men, such as the Government School Inspectors, are called upon to decide? Good plans will then be secured, regardless of tricky effects, too often seen in competition drawings, to catch the eyes of the unwary. If architects risk the cost of competition, surely committees should go to sufficient expense to secure proper decisions.—I am, &c.,

AN ARCHITECT.

ORNAMENTAL BRICKS.

SIR,—Allow me to make a suggestion in your valuable paper relative to ornamental building and brickmaking. In my youthful days I produced a very pretty sample of fancy bricks in imitation of marble, not in texture, but as regards veined and mottled appearance, by the mixture of various clays or composts used for bricks, and I think in our churches and public buildings, if studied, it would have a very pleasing effect in columns, capitals, bases, buttresses, &c. They could be produced at the same cost as those used ordinarily for building, or nearly so. Where I was engaged some years ago we had six feet of good fat yellow clay, which made some of the best red bricks, both for colour and soundness, I ever came across; below that was gin. of sand, and below that some fine fat deep-blue clay; this, when burned, produced a very sound brick, of a deep purple brown, very near black. Some of the above was washed with chalk for our white bricks and the manufacturing of cutters, which burned a pale buff. These, intermixed, produced a great variety, according to the various proportions used. Now with the white clay used in the manufacturing of common white delf, a greater variety can be produced. There are many things that I know not of for colour that can be brought into use that will produce a still greater variety, and if used in arches for windows and as above, with fine joints, and dressed off, afterwards treated with a coat or two of what I did not know and many did not dream of then—viz., silicate of soda—they would be most durable, and with judicious treatment add great beauty to our architectural accomplishments, and not be so unsightly as our present cement and plaster compounds.—I am, &c.,

JACK OF ALL TRADES.

ARCHITECTS' OFFICE HOURS.

SIR,—I am very pleased to see the question has been raised as to architects' office hours, and I strongly advocate the cause of "Assistant." In nearly all branches of industry of late years the tendency has been to shorten the hours of daily labour. Amongst the lower classes if they do not obtain what they demand they strike, and in the end get their own way. Now I would not wish to advocate a strike amongst architects' assistants, or any course so demoralising, but would suggest the hearty co-operation of all assistants, and that a committee be formed to put the matter plainly before the Institute, Association, and leading architects, so that they might form some rule that would become general throughout the profession. In these days of competition and education one needs to have a considerable amount of study that cannot be obtained during office hours if he intends to make himself at all fitted for the profession. The office hours in London are generally 10 to 5, and I suggest these should be made the rule, with an hour in the middle of the day, quite long enough for the duties of a draughtsman. Also I would ask that our present miserably small salaries be somewhat improved. An assistant is expected to be a man of talent and education, and yet can often only obtain a salary somewhat inferior to the wages of a mechanic. At the present time a vast deal of both time and money is expended in useless competitions, for which, to a great extent, the assistant has to suffer, both by prolonging the office hours and tending to depreciate the value of his services. Now it rests greatly with the assistants themselves so remedy these evils, and I think if the subject has only proper ventilation in your valuable journal, and there is a hearty co-operation amongst ourselves, it will not be long before we are placed on a footing more suitable to our position, and on better terms with our employers.—I am, &c.,

Bradford, November 29.

UNITY.

SIR,—I quite concur with your correspondent, "Assistant," in thinking that the office hours of architects' clerks and pupils might be shortened with benefit both to employers and employed. In the office in which I am engaged the hours are from 9 a.m. till 6 p.m., with three-quarters of an hour for dinner; and any one who knows what the duties of an architect's assistant are will agree with me that this is too great a length of time to keep the mind intently fixed upon the work in hand; and the consequence is that after four o'clock in the afternoon very little really useful work is done, not from want of will, but because the thoughts have become confused and the brain tired. After a close day's work like this, one naturally thinks that a little exercise is necessary, and by the time he has taken his tea and the said exercise, I can assure you there is very little time for study and improvement, even if (after a particularly close and hard day) he has the inclination for the same. I hope, with "Assistant," that some of our principal men will take the matter in hand, feeling sure that the increase of energy and professional knowledge will fully compensate for the loss of time consequent upon the reduction of the office hours.—I am, &c.,

GOTHIC.

PLANNING HOUSES.

SIR,—As there are so many opinions about what the plans and their cost should be, would it not be better to give two prizes, one for mansions not to exceed £7,000, and one for a good villa or farmhouse not to exceed £3,000, by which we should get a class of plans that might be useful for everyday life, not merely "imaginary things"? Farmhouses, as a rule, are as much wanted as any kind of house, to take the country through, and will be still more so as agriculture keeps advancing. Now it's very rarely that a landowner will lay more than a thousand pounds out for a farmhouse; (oftener £500), as the farmer looks to the land to produce the rent, and invariably cares little about the house, provided it be "comfortable and convenient." So let us keep the main object in view, and stick to good plans, with a fair elevation. I would suggest that you allow each competitor half a column to describe his plan, what materials he intends to build with, and how the same is to be finished, and the probable cost in his own neighbourhood. As economy is a great desideratum, people often have to use such materials as the locality will produce. If you limit the amount, let the architect be unencumbered by any condition as to what plan or style he may adopt. I see some advocate the Gothic. Generally speaking, Gothic is by no means a suitable style of house for many situations, so let the competitor have free and fair use of his abilities to adopt the style he thinks best.—I am,

Cumberland.

J. B. RUSTICS.

SIR,—There is one point in the letter of your correspondent "H." which seems to me to deserve careful attention before the terms of the "house-planning" competition are declared. He says that the architects have built ninety-nine per cent. of the houses in "The City of Villas" according to their own sweet fancies, and free from any control. The results, he tells us, are, that small holes over tanks are made to do duty for staircase lights, and that most of the buildings are badly arranged.

This is his own deliberate verdict on the planning of a collection of houses which have been erected without reference to the requirements of actual clients; and yet in urging you to offer a premium for the best of this bad kind, he enthusiastically advocates the per-

petuation of a system he condemns. If, on his own showing, the architects have utterly failed in practically carrying out their own unrestricted ideas, how can it be reasonably expected that the publication of plans, made under even more objectionable circumstances, can succeed in creating a standard for the future? Surely no argument against the proposed scheme could be stronger than his own facts? He clearly shows by "The City of Villas" that good house plans must be carefully prepared to suit the wants of those who are chiefly concerned.

I think the explanation he asks for, with regard to the meaning I attach to "hours of idleness," quite unnecessary, as there are few, if any, of your readers who will have any difficulty in comprehending the full significance of the words.—I am, &c.,

READER.

SIR,—I am much interested in the proposed prize for plan of gentleman's mansion, but hope in your conditions you will include the laying out of house-yard, and that for carriages and carriage horses.

J. C.

SIR,—I should hope that the jealous, unworthy suspicions manifested by "H." are not entertained by many. There can be no such clique as he supposes. In competition, every man's hand is against every other man. In the plan I suggested the interests of those at a distance might safely be left to the London competitors.

My objection to the designs being sent in under motto is the well-known fact that the system utterly fails to secure secrecy. There are always dishonourable persons, who, revealing their authorship, canvas for favour. In the present case it might not be so, but I think it would be well to guard against even the suspicion of it. If there is divided opinion on this subject, I do not see why it should not be left optional, those sign openly who like, and if any are ashamed or have fastidious fancies, they can assume the disguise of those trite or favourite maxims "Dum Spiro Spero," "Laborare est orare," &c. Personally, I care not what may be decided upon; I dare say in any case I can come to the front if I send in, though "H." be in the lists. There is no inconsistency in wishing the drawings signed though I may write under initial. The letters are not competitive, and towards you, sir, there is necessarily no reserve. No analogy exists between the cases. Though "H." insists that the general area of house shall be limited, it is not to be to the exclusion of designs not conforming to the rule. What, then, is the use of any rule? Name principal rooms, I say. Where so much difference of opinion exists it will be impossible to satisfy all. Perhaps the best plan would be to have a sort of "free fight," everybody send what they like and how they like!

With regard to perspectives, if allowed, I have but one word to say: I hope there will be no "fudging."—I am, &c.,

M.

STAINED GLASS.

GOLDENHILL CHURCH, NEAR STOKE-ON-TRENT.—The chancel has recently been enriched by the addition of a large stained glass window of four lights, of Geometrical design, surrounded by a richly-coloured border, with medallions in the centre lights, containing the text, "Believe on the Lord Jesus Christ, and thou shalt be saved." The window was executed by Mr. T. W. Camm, of Smethwick, near Birmingham.

WHITLEY CHURCH, YORKSHIRE.—The remaining windows of the south aisle have lately been filled with stained glass. The windows contain figures of S. Matthew and Thomas, James and John, Andrew and Peter, with angels in the tracery bearing appropriate texts. Underneath are fixed brass plates containing the memorial inscriptions to the members of the Earnshaw family, to whom the windows are erected. The whole has been designed and executed by Mr. T. W. Camm, of Smethwick, near Birmingham.

STATUES, MEMORIALS, &c.

PROPOSED MONUMENT TO LORD DUNDONALD.—Mr. G. A. Lawson, the sculptor, has been commissioned to execute a statue in bronze of the late Admiral Lord Dundonald, to be erected in Valparaiso, in commemoration of his services to Chili.

A STATUE TO SHAKESPEARE.—Shakespeare is at last to have a statue erected to his memory. The site chosen is at the end of Park-lane and Hamilton-place. How the matter arose was this. A benevolent lady left a large sum of money for a drinking fountain to be placed at the site mentioned, and requested Mr. Ayrton to choose the subject, and carry out the necessary arrangements. The First Commissioner of works thereupon issued an invitation to six of our best sculptors to send in designs, and Messrs. Noble, Armistead, Thornycroft, Philip, and two others acceded to the request. The design chosen is that of Mr. Thornycroft. It represents Shakespeare, supported on the one side by Chaucer, and on the other by Milton. At the back of the poets is the figure of Fame blowing a trumpet, and underneath there is a very narrow rill of water constantly trickling.

Intercommunication.

QUESTIONS.

[2391].—Phœnician Bevel.—What is a Phœnician bevel?—LUX.

[2392].—Tell-Tale Gate.—Will any reader inform me of the best method for checking the number of visitors to a skating-pond? I have seen a wheel with four arms used for this purpose, but do not know if it is the best, nor who is the maker of these?—D. H.

[2393].—Ornamental Masonry.—Will any correspondent kindly inform me where I can get a work upon ornamental masonry and stone-carving, and likewise whether there is any work published on monuments, tombstones, &c., as I have never seen anything of the kind advertised?—I. J. K.

[2394].—School Building.—Would any reader kindly give me, through your columns, the amount of superficial area required by Government for each scholar in the schools supported by the Government; and also the height (internally) to the wall-plate in school buildings?—F. W. S.

[2395].—A Legal Question.—I am lessee of a dwelling-house for ten years certain, and am bound under a repairing clause. The premises have sunk or "settled" since I have occupied them, and the result is, that the walls, cornices, and plastering have cracked, and some of the window-sills are broken in consequence. Am I bound to make good these damages under the terms of my lease? I have recently painted the fronts, and was put to considerable expense in cutting out the shaky plastering caused by the "settlement" in question, and before doing so I applied to my landlord to defray so much of the cost as was thereby occasioned, but he refused, and said I was compelled to do the whole myself. Is this so?—STENTOR.

[2396].—Derbyshire Spar.—Would any of your readers inform me where to procure Derbyshire spar for the purpose of top dressing asphalt and tar pavement; also cost of same?—S. G.

[2397].—Kentish Cottages.—Could any of your readers kindly give me any information, or tell me of any book, about the red-tiled cottages of Kent and Sussex? A client of mine wishes to build some on his estate in Wales, and I want to know what kind of walling is used, how openings are treated, &c.—J. B. F.

REPLIES.

[2376].—Decay of Iron Railways.—Your correspondent "H. W. P." is evidently not acquainted with the more modern method of putting up iron railings. The plan of "letting in" the iron into a kerbstone is only now practised on a very small scale. An excellent example of the new and improved mode is to be seen in operation along the Thames Embankment, and as "H. W. P." may not have seen it, I will briefly describe it. First, a trench, about a foot broad, by eighteen inches in depth, is taken out with a spade, and half filled with concrete; then the railings are held up by temporary supports while being bedded in the concrete, and accurately adjusted in line. Next, the remainder of the trench is flushed up with concrete all around the base of the railways, and the job is done. Thus, we get rid of kerbstone, running with lead, and all the chipping and fixing belonging to the old plan. The reason of the corrosion of the iron in the latter case is due to the galvanic action set up between the lead and iron. In fact, the two dissimilar metals, and the presence of water or damp, constitute a complete galvanic battery.—J. H. T.

[2379].—Iron Wire Suspension Railways.—The railways referred to are, no doubt, the "wire-rope lines," which are set up in that locality *pro tempore*, as they are intended to be sent to Egypt. They are put up by the "Wire-rope Company," formed some time ago to work Hodgson's patent. All particulars can be obtained of Mr. Beale, the secretary, 21, Gresham-street, E.C.—JUSTITIAN.

[2382].—Proper Door-Cases.—Where the doorways are entirely filled up with wood, the stanchions are mortised into the wooden eill, which forms a proper door-case; but all stone door-cases must have stone eills.—I. J. K.

[2384].—Hot-Water Pipes and Woodwork.—Certainly if the pipes get too hot the woodwork will ignite. Was not the fire at the Crystal Palace caused by the over-heating of the warming-pipes?—F. L.

[2388].—Filtering River Water.—I do not think "H. H.'s" plan would answer, as, excepting at high water, there would not be sufficient pressure to force the water through his filter F. It also strikes me as a great mistake his making the basement floor below the level of high water. Surely it ought to be above, and if so, why have the top of cistern for containing the filtered water below the level, that the water may reach even with the highest floods, as nothing is more treacherous than a ball tap? If "H. H." would call at the offices of this company, I shall be happy to give him all the information in my power, and free of any expense.—R. RUDING, London and General Water Purifying Company, 157, Strand, W.C.

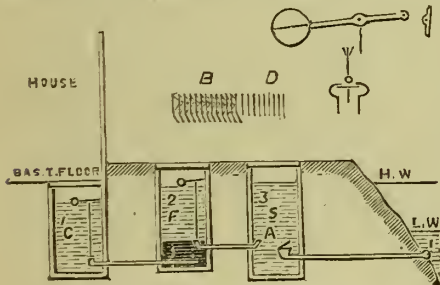
[2388].—Filtering River Water.—"H. H." must first carefully excavate the required area of ground to be occupied with his filters, &c., and then put in a puddle wall, say, 15in. thick round side walls

and under bottoming. Side walls of 9in. brickwork to be carried up to near surface, and within which a bottoming of hand-set rubble, 7in. thick, must be laid as level as possible. Walls of filter may be covered over in any approved manner; flags to be preferred if spans will suit same, such pavement being in no case less than 4in. thick. Filtering materials to be as follows:—

	Ft.	In.
Whinstone metal, to go through a 3in. ring ...	1	0
Whinstone metal, to go through a 2in. ring ...	0	6
Gravel	0	3
Perforated fire-clay tiles	0	1½
Sand	2	0
Total depth of materials	3	10½

Whinstone to be hard and properly screened. Gravel may be saved from passing the sand through a ½in. riddle. Tiles to be glazed and well burned, 9in. or 10in. square, and 1½in. thick, with from 40 to 50 holes in each tile. Sand to be passed through a ½in. riddle, and properly washed to free same from any earthy matter. The various materials to be carefully laid, and the sand properly smoothed to a level surface at top. In addition to this filter, a primary one of coarser gravel and sand may be made nearer river, should the water be considered very impure. In addition to the ball-cock, a sluice may advantageously be put up at inlet, which would effectively guard against any danger in event of ball-cock getting out of order by an unseen occurrence. All levels must be properly attended to to insure success.—H. C., Edinburgh.

[2388].—**Filtering River Water.**—The following is a sketch that will put "H. H." right: The general arrangement is the same as regards cisterns. This will give him very little trouble, and furnish him with river water as pure as he will be enabled to get it by filtration. G.L., ground level; H.W., and L.W., high and low water-line; I, inlet pipe, furnished with either a wire basket or a perforated rose; G, the setting tank or cistern; F, the filter; and C, the house supply cistern; the two last are furnished with a ball and lever, the same as ball-cock, but furnished with an internal valve, V, in the supply pipes in the bottoms, which will require very little to act upon them, and in case of floods, the back pressure will aid in keeping all tight, and I think it will be all two to one if they both get out of order together, or at the same time. The filter proper at the bottom of F is composed of bricks, either stock or place, but I prefer the former; placed in the bottom herring-boned or diagonal (see B), with a space of an inch between rows; upon this a course of



the same face downwards (see D); now, upon the top of that, some washed gravel or beach, screened through 1in. mesh screen, three inches thick, next course 2in. finer, about 1in. of sand, 2in. of chalk brit or fine chalk, 1in. small charcoal, and 6in. fine sand. This will complete your filter; the supply pipe, I, in the cistern S, is furnished with an elbow like the rest, and has, likewise, a hopper or inverted cone. In the bottom of this is a perforated plate, and the top within an inch is furnished with another; the space between this should be furnished with charcoal, broken up about the size of peas; the said cone is furnished with a flap nose return valve, faced with flexible softened rubber. I recommend this as I have had some in use from six to eight years in contact with a brass cock, and upon inspecting it the other day found all in perfect order, as on the day it was applied. The advantage of this is, if rain should come between tides you would have a larger supply of water on hand, as 1, 2, 3 was all charged last tide, and not such an influx of muddy water the next. N.B.—You can reduce size of filter (see dotted lines in F) this can easily be replaced with little trouble and cost, and is effective.—JACK OR ALL TRADES.

LEGAL INTELLIGENCE.

COMPENSATION FOR INTERFERENCE WITH RIGHTS OF COMMON.—**STONEHOUSE v. LONDON AND BRIGHTON RAILWAY COMPANY.**—This case, heard in the Court of Queen's Bench on the 10th ult. (sitting in Banco, before the Lord Chief Justice, Mr. Justice Mellor, Mr. Justice Lush, and Mr. Justice Hannen), raised a most important question as to right of commoners to sue for compensation for interference with their rights of common on waste lands. It was an action by the representatives of the late Mr. George Phillips, of Streatham Park, in the manor of Tooting, Surrey, to recover compensation for interference with his rights of common on the Streatham Common. In 1853 the Crystal Palace Railway Act passed, under which the Brighton Company were empowered to make a railway which

would run through the common. The Compensation Acts make provision for proceedings for the purpose of taking possession of land over which parties had rights of common, but those proceedings were not taken, and compensation was only made to the lord of the manor, who received a sum of £1,900. Mr. Phillips was the principal person entitled to commonable rights, and the company offered him £20 an acre for an extinguishment of his rights, but he refused that offer, and demanded £200 an acre. The railway took four acres of the common, and besides that it so intersected and cut off another large portion of the common that access could not be had to it, and for this injury he claimed about £1,000 as compensation. Many proceedings were taken to compel compensation, but without effect, and the company made their line. In the meantime Mr. Phillips died, and his representatives sued for compensation, but the right to maintain the action was disputed. Mr. Prentice, Q.C. (with him Mr. Murphy), argued for the plaintiff; Mr. Pollock, Q.C. (with him Mr. Joyce), argued for the company. After a long argument, which took up nearly all the morning, the Court decided in favour of the plaintiff, that the action was maintainable. The Lord Chief Justice said the law was that a company, in order to obtain lawful possession of land over which rights of common existed, must settle with the lord in whom the soil was vested, and also with the commoners who enjoyed rights of common over the wastes of the manor. Here, however, the lord only was compensated, and the proper course had not been taken to extinguish the rights of the commoners. Their rights, therefore, remained, and they retained their ordinary common law remedy by action. Mr. Justice Mellor concurred, and observed that the company were bound to take the initiative in the proper proceedings to extinguish the rights of the commoners. The other learned judges concurred.—Judgment for the plaintiff.

RES IPSA LOQUITUR.—**WHAT IS SUFFICIENT PROOF OF NEGLIGENCE?**—**FALLING OF A BOARD.**—In this case, heard in the Shoreditch County Court on the 3rd ult., before J. B. Daseant, Esq., (the judge) and a jury, the plaintiff was a journeyman pianoforte-maker, and the defendant was the proprietress of certain saw mills in Shoreditch. It appeared from the evidence of the plaintiff that he was in the habit of frequenting the defendant's mills for the purpose of having his wood sawn, and on the day in question he was proceeding through the defendant's yard with two or three planks, which he was carrying over his shoulder, when several boards, which were standing in the defendant's yard, fell down, and knocked the planks from his shoulder, one of which severely crushed his foot, and caused him to keep his bed for several days. The claim was for £16 14s. 4d. for medical attendance and the deficit in the amount of the plaintiff's earnings during his illness. The plaintiff deposed to the fact that he did not cause the boards to fall, and that he had the permission of the defendant to have his wood sawn in her yard. It was also proved that the boards which fell were resting on each other. For the defendant it was contended that there was no proof of negligence on the part of defendant to go to the jury, and that this was not one of the cases where *res ipsa loquitur* applied. It was further contended that the defendant's yard was not a "public place" within the meaning of the authorities. The plaintiff was not invited to come there, but he did so for his own personal convenience, and the defendant would not be liable for any accident which was not caused by her actual negligence. For the plaintiff it was submitted that the mere fact of the planks falling, there being no contributory act of the plaintiff, was sufficient in law to imply negligence. This was a case of *res ipsa loquitur* ("Kearney v. London, Brighton, and South Coast Railway," 18 W.R. 1,000). The case of "Briggs v. Oliver" (35 Exch. 163) was also cited. Mr. Daseant, the judge, said the question for the jury was, firstly, whether there had been any negligence on the part of the defendant; and secondly, was the plaintiff lawfully on the premises of the defendant? If he were trespassing, he must take the consequences of his act; if the accident had happened through the contributory negligence of the defendant the plaintiff could not recover; but the fact of the defendant keeping a yard for the purpose of receiving customers was sufficient to give the plaintiff a right to be on her premises for purposes of business. If the plaintiff had been aware of the unsafe stacking of the boards it would have been his duty to have used a greater degree of caution in carrying his planks. The onus was on the plaintiff to prove to the satisfaction of the jury that he was entirely free from blame, and to satisfy the jury of the negligence of the defendant; but under the circumstances of the present case, as the boards fell without any interference or negligence on the part of the plaintiff, the law would imply the fact that they were stacked in a negligent manner, *res ipsa loquitur*. On the question of damages the plaintiff was entitled to recover all such expenses and losses in the business as had been actually caused by the accident; but if the plaintiff commenced work, and so suffered from a relapse, the defendant would not be liable for that; plaintiff must do everything in his power to save the defendant from extra expenses.—Verdict for the plaintiff for the full amount.

BUILDING CONTRACT.—AGREEMENT TO ABIDE BY ARCHITECT'S CERTIFICATE.—(Kimberley v. Dick, M.R., 20 Weekly Reporter, 49).—This case arose out of a building contract drawn in the ordinary form. On a recent occasion (13 S. J. 652) we commented on the effect of such a contract, showing that it put the builder in the power of the architect to a remarkable extent. The architect may refuse to certify that the work is properly done, when it really is so, as the allegation was in *Davis v. Taylor* (13 S. J. 652); or he may order extra works, and refuse to prolong the time for completing them, and so expose the builder to time-penalties, as was the case in *Jones v. S. John's College, Oxford* (19 W. R. 276); or he may order extra works and refuse to make a proper allowance for them, as was alleged to be the case in *Kimberley v. Dick*. In the first two of these cases the architect's decision was considered final, and no relief could be given against it by any court of law. The same would, no doubt, have been held in the third case, if the question had depended on the interpretation of the contract alone. It appeared, however, that the employer had directed the architect not to let the cost of the works exceed a certain sum, the architect had promised in writing to keep within the limit, and the builder had no notice of this arrangement when he signed his contract. The Master of the Rolls held that this arrangement was a material circumstance, which ought to have been communicated to the builder. Its effect was that if the cost of the works exceeded that sum, the surplus would have eventually to be paid by the architect himself. Hence it made it his interest to disallow all claims for extra work which were at all open to question, and to allow the smallest sum that could well be allowed for all undoubted extras. If the builder had known that the architect would be thus biased, he would probably have declined to submit unreserved to his arbitration. The Court, therefore, held that the clause appointing the architect arbitrator for extra works was not binding on the builder, and the contract should be read as if it were omitted. It would, of course, have been possible for the Court to have limited itself to setting aside the clause in question, and to have left the builder to his common law right to sue for work done. It was, however, obviously better for the Court of Chancery to dispose of the whole case when once it had got seisin of it; the Master of the Rolls accordingly took this view, and directed an inquiry what works had been done by the plaintiff which were not included in the contract, and what works had been done otherwise than as provided by the contract, and what sums ought to be allowed to the plaintiff for such additions and variations respectively. The Court, therefore, undertook to do the arbitration for which the architect was disqualified. This case has a lesson for both builders and employers. It should help to awaken the former to the precariousness of the position in which they often place themselves, owing to the careless way in which they sign their contracts; and it should show the latter that when they stipulate with an architect for the limitation of the cost of a building, that fact should be communicated to any builder they may employ. It should also be remembered that if, as was the case in *Kimberley v. Dick*, the builder be engaged by the architect as agent of the employer, the limitation of the architect's authority will not be binding on him unless he was aware of it. It will be of no avail for the employer to say that he only authorised the architect to order buildings up to a certain sum; for he will have allowed him to hold himself out as agent with an unlimited authority. The employer will therefore, in such cases, be primarily liable to the builder, and will only have such remedy over against the architect as may arise out of the agreement between them.—*Solicitors' Journal*.

DISPUTE AS TO THE SALE OF BRICKS.—**SHEPHERD v. SMITH.**—In this action, tried recently in the Halsted County Court, before J. T. Abdy, Esq., the plaintiff, a builder, of Colchester, sought to recover £17 from the defendant, late a brickmaker at Ardleigh, under the following circumstances:—Some time ago Mr. Smith, being about to give up the brickfields he held under the Countess Cowper, had a sale, the auctioneer being Mr. Turner, of Ipswich. A certain heap of bricks was put up and knocked down at 23s. per thousand to a builder of Colchester, but there were reasons for not allowing the lot to go in that direction, and Mr. Shepherd (before the next lot was put up) was asked if he would take the bricks at the price of his bid, 22s. per thousand. He said he would, and proceeded next day to commence to cart. Before all were taken away, Mr. Smith asked for payment for 72,540, and the money was paid. Subsequently, upon plaintiff making up his account of bricks received, he found that he had received 16,000 short of what he had paid for. The defence was that plaintiff's foreman (Pudney), who had been sent to Ardleigh to examine the heap, was satisfied the number was correctly charged for, and also that if not, the conditions of sale precluded Mr. Smith being responsible.—Plaintiff was non-suited.

M. Schneider, the master of the great Crensat Works, has reduced time at his establishment from eleven to ten hours, and this without being solicited.

WATER SUPPLY AND SANITARY MATTERS.

BRADFORD.—Last week Mr. Rawlinson, C.E., attended at the Corporation Offices, Bradford, on behalf of the Local Government Board, to take evidence in respect to an application by the Town Council, acting as a board of health, for power to borrow an additional sum of £50,000 for the further extension of the borough sewerage system.

THE SEWAGE OF CAMBRIDGE.—Mr. Bailey Denton has issued his report upon the condition of the River Cam, and the question of diverting the sewage therefrom. He proposes to take 400 acres of land at Chesterton, and 250 acres at Coldhams Common and Fen Ditton. Referring to the cost, Mr. Denton says that if irrigation be adopted, and the maximum quantity of land taken for the purpose, the total outlay, including 400 acres of land, may exceed £70,000. Allusion is made to the sluggish nature of the Cam, and the pernicious influence of the locks by which the navigation is maintained. If the liquid refuse of the town is to be purified before entering the river, this cannot be done by simple gravitation, but the sewage must be lifted.

DRAINAGE OF LINCOLN.—Plans of the proposed new drainage scheme for Lincoln have been deposited by the engineers who have it in hand. Three or four years ago Mr. Lawson, C.E., sent in an estimate, which amounted to £49,000, exclusive of the land required for irrigation with the sewage. The present plans are on a slightly smaller scale.

DONCASTER WATER SUPPLY.—Notice is given of an intention to apply to Parliament for the incorporation of a company to supply Doncaster and the adjoining villages of Couisboro', Warmsworth, Balby-with-Hexthorpe, &c., with water. The storage reservoir is proposed to be made at Hooton Brook, and the service reservoir for Doncaster near Tenterlane. The promoters, curiously enough, ask for powers to buy from the Doncaster Corporation the now-existing waterworks in Frenchgate. The Town Council will oppose the scheme, which, if carried out, will cost £40,000.

THE SANITARY DEFECTS OF PARIS.—M. Belgrand, Inspecteur-Général des Ponts et Chaussées, and director of water and sewage, has just published a pamphlet on the sewage system of Paris, and on modifications of the present system of outfall and the utilisation of the sewage. These important matters (says *Engineering*), although they have been largely and for a long while discussed, have advanced but little up to the present time, when the actual conditions give rise to the most energetic complaints. The chief inconveniences encountered are as follows: The houses with fixed cesspools, deprived of water distribution, are unhealthy; the raising and transport of sewage are costly, and fill the city with noxious odours; the deposit of these matters at Bondy renders the neighbourhood almost uninhabitable, and greatly depreciates the value of neighbouring property; the discharge of the sewers into the Seine cumber the river and sullies the water for a long distance beyond the point of outfall; and lastly, a great mass of fertilising matter is lost to agriculture.

ROMFORD.—Mr. Herbage, surveyor to the Romford Local Board of Health, proposes to drain all the surface water of the town into the river, and has submitted a plan for the same, which he estimates can be carried out at a cost of £266. He proposes to carry drains through High-street, South-street, North-street, the Market-place, Waterloo-street, S. Andrew's-road, Queen-street, and portions of the Eastern and Western-roads. The length of pipe required would be about 6,400ft. The sewage is already utilised for irrigation purposes on a farm in the neighbourhood of the town.

THE BRENTWOOD SEWERAGE.—A meeting has been held at Brentwood to consider the future management of the sewerage works. The Brentwood Vestry had received a letter from the Local Government Act Office, which stated that Messrs. Russ and Minns, the sewer authority appointed by the Office, had completed the sewerage works, at a total cost of £5,499 16s. 6d., which excluded a few outstanding claims for compensation. Now the works were complete, Messrs. Russ and Minns's authority would come to an end, and the Local Government Act Office wished to know whether the vestry would appoint a competent person to superintend the works, connect drainage, &c., or whether the Office was to do it for them? The consideration of the question was adjourned.

The new Gaiety Theatre, Dublin, was opened on Tuesday evening last. The aspect of the interior somewhat resembles the Gaiety in London, and by the same architect, Mr. C. J. Phillips.

A portrait of the late Mr. De Wilde, painted by Mr. J. Edgar Williams, has recently been presented to the Northampton Museum. The inscription on the frame is as follows:—"George James De Wilde, author, artist, humourist, and editor of the *Northampton Mercury* for upwards of forty years. Presented to the Northampton Museum by his admirers and friends, 1871."

Our Office Table.

INSTITUTION OF SURVEYORS.—At the first ordinary general meeting for session 1871-72, held on Monday, November 13th, the following names were read and passed to be balloted for on December 18th—viz., as Members:—John Brown, Rose-hill, Chesterfield; and Frank Bowry Buckland, Windsor. Several donations to the library having been announced, a vote of thanks was unanimously given to the various donors. The President, Mr. Richard Hall, then opened the session with an address, the substance of which appeared in the *BUILDING NEWS* of Nov. 17th. A vote of thanks was unanimously given to the President for his address. Mr. William Edward Woolley, of Loughborough, was then balloted for and declared duly elected as an Associate. The next meeting will be held on Monday evening next, December 4th, when a Paper will be read by Mr. J. Clutton (Past President), on "The Cost of Conversion of Forest and Wood-land into Cultivated Land." The chair to be taken at eight o'clock. The following candidate will be balloted for:—Mr. Edward Vigers, Jun., Elgin Lodge, S. Peter's-park, N., as Member.

CLASS OF CONSTRUCTION, ARCHITECTURAL ASSOCIATION.—The following are the questions to be worked out for the next meeting of this class (Friday next), the subject being Carpentry:—1. What are sleepers, lintels, templates, raising-plates, pole-plates, and wall-plates? How are the latter fixed or joined at angles? 2. Sketch a trussed timber partition, 15ft. long, 10ft. story, having another immediately above and below, a door 3' 3" wide, to be 2ft. from one end. Figure scantlings. 3. Give drawing of a staging for three bells (2' 9", 3' 6", and 4' 3" high respectively), in a tower 16ft. square inside measurement. 4. A pier in a nave arcade is fractured, and it is desired to replace it with new, and to reconstruct one of the arches with its apex 4ft. higher than before. Give the shoring required, and describe the progress of the works. 5. Give drawing of a timber foot-bridge over a stream 25ft. wide. 6. Sketch the fixing for a flag-staff 25ft. high above a tower.

BRADFORD GRAMMAR SCHOOL COMPETITION.—We find that the set of plans for the new Grammar School which was selected for a third prize was designed by Mr. Edward Simpson, architect, Tyrel-street, Bradford, and not by Messrs. Healey, as stated in our previous report.

CITY COMMISSION OF SEWERS.—At a meeting of the City Commissioners of Sewers, held at the Guildhall on Monday, Mr. J. T. Bedford was unanimously chosen chairman of the Commission, in the room of Mr. H. De Jersey, who has been appointed by the Court of Common Council to the office of Secondary of London. The new chairman was well received. Mr. De Jersey tendered his acknowledgments to the Commissioners for the honour they had conferred on him for ten successive years in electing him their chairman, and after he had retired it was referred to the Finance Committee to draw up an address to him, acknowledging the services he had rendered to the Commission.

THE LAW OF DILAPIDATIONS.—In connection with this subject, upon which a series of articles is now appearing in the *BUILDING NEWS*, we may state that at the last meeting of the Law Students' Debating Society, held at the Law Institution, Chancery-lane, the following question was discussed:—"In an action by a lessee against his lessor for breach of covenant to repair the main timber and roofs of his demised premises, is the plaintiff entitled to recover if he has not given defendant notice of the repairs being required?" Mr. A. J. Harvie opened the debate in the affirmative; the society decided the question in the negative.

LEASES AND AGREEMENTS FOR LEASES.—Recently a lecture was delivered to the Birmingham Law Students' Society by Mr. G. J. Johnson, "On the nature of, and distinction between, leases and agreements for leases." Having dwelt upon the nature of leases at common law, as stated by Littleton, who, he observed, had put the law into a mould the shape of which it had retained ever since, he proceeded to show how the mischiefs resulting from the application of the common law rule that when possession was given the terms of the lease might rest on parole evidence, was remedied by the Statute of Frauds. The tendency of the decisions of the judges in construing instruments of the nature of leases was then reviewed and explained. Passing over the 7th and 8th Victoria, c. 76, the lecturer pointed out the effect of the 8th and 9th Victoria, c. 106, on leases and on the decisions of the judges. The present state of the law as affecting leases and agreements for leases was next considered, and the lecturer concluded with an exposition of the modern doctrine which governs tenancies-at-will.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—ROYAL INSTITUTE OF BRITISH ARCHITECTS. (1) "On the Bridges of London." By H. Carr, Esq., C.E. (2) "On the Fall of a Church Dome, with Suggestions for its Construction on Better Principles." By Mr. Wyatt Papworth, Fellow. 8 p.m.
INSTITUTION OF SURVEYORS. "On the Cost of Conversion of Forest and Wood-land into Cultivated Land." By Mr. J. Clutton (Past President). 8 p.m.
SOCIETY OF ENGINEERS. "On Floating Breakwaters." By Mr. Thomas Cargill, C.E. 7.30 p.m.
TUESDAY.—INSTITUTION OF CIVIL ENGINEERS. "On the Stresses of Rigid Arches and other Curved Structures." By Mr. William Bell, M. Inst. C.E. 8 p.m.
WEDNESDAY.—SOCIETY OF ARTS. "On Sewage as a Fertiliser of Land, and Land as a Purifier of Sewage." By J. Bailey Denton, Esq. 8 p.m.
FRIDAY.—ARCHITECTURAL ASSOCIATION. Meeting of Class of Construction; subject: "Carpentry." 6.30 p.m.—Meeting of Class of Design; subject: "Oriel Window with Internal Fittings, 4in. Scale." 8 p.m.

CHIPS.

Great improvements will shortly be made in the dock accommodation on the Tyne. The Tyne Commissioners have resolved to make a dock at Coble Dene, from comprehensive plans prepared by their engineer, Mr. Ure.

Another addition was on Monday made to the number of metropolitan tramway lines already in use in London, by the opening of the new line from the Euston-road end of Hampstead-road to Kentish Town. In anticipation of the opening of this new line, the omnibus fares were reduced a few days since.

The design of Mr. William Watson, of Wakefield, architect, in a limited competition for the new Wesleyan Sunday Schools, West Parade, Wakefield, has been accepted by the committee. The work will be carried out very shortly, and will cost about £1,500.

The annual general meeting of the Society of Engineers will be held on Monday, the 11th of December, in the Society's hall, Westminster Palace Hotel, for the election of officers for the ensuing year. The chair will be taken at half-past seven o'clock precisely.

The City of London Commissioners of Sewers have given notice of their intention to apply to Parliament for an act to preserve Sun-street as a public thoroughfare, as the Great Eastern Railway Company claim powers to stop up the street.

The scheme for the improvement of S. Mary's Church, Colchester, which commenced in a proposal for a new chancel and benching, then extended to new roofing, has now got to the length of new side walls. The whole church, excepting the tower, will be new.

A new cattle-market was opened at Leicester on Wednesday week. When the offices and abattoirs in connection with it have been completed, the cost will have been from £25,000 to £30,000. The market and abattoirs are connected with the Midland Railway.

Timber Trade Review.

PRICES, November 27.—Timber, per load of 50 cubic feet: Riga, £3 5s. to £3 10s.; Crown Memel, £4 to £4 10s.; best middling £3 5s. to £1 15s.; good middling and seconds, £3 to £3 5s.; undersized, £2 10s. to £2 15s.; small, short, and irregular, £2 to £2 10s.; Stettin, £2 10s. to £2 15s.; Swedish, £2 7s. to £2 15s.; ditto small, £2 to £2 5s.; Swedish and Norway balks, £2 to £2 5s.; Crown Memel oak, £5 10s. to £6 10s.; ditto brack, £4 10s. to £5 5s.; Dantzic, and Stettin crown oak, £5 to £6; ditto brack and unsquared, £3 15s. to £4 5s.

Deals and Battens, per Petersburg standard hundred: Archangel yellow, £12 10s. to £14 10s.; ditto seconds, £9 10s. to £10; Petersburg yellow, £12 10s. to £13 10s.; Wyburg yellow, £9 15s. to £10 5s.; Finland and Handsawn Swedish, £6 15s. to £8; Petersburg and Riga white, £8 to £9; Christian yellow and white, best quantity, £10 to £12 10s.; Norway deals, other sorts, £7 to £8; ditto battens, all sorts, £5 5s. to £7; Swedish and Gothenburg, good stocks, £10 to £10 10s.; ditto common and thirds, £8 10s. to £9 10s.; Gelle and best Swedish deals, £10 10s. to £12 10s.; Swedish battens, £7 10s. to £9 10s.; Quebec best pine, floated, £16 to £18; ditto bright, £18 10s. to £20; Second floated ditto, £12 to £13; ditto bright, £13 10s. to £14 10s.; Third floated, £8 to £9; ditto bright, £8 15s. to £9 5s.

Trade News.

WAGES MOVEMENT.

SUNDERLAND.—An adjourned meeting of house joiners took place at Sunderland on Tuesday evening to receive the reply of the masters to their demand for 50 hours at 30s. per week. The masters offered 30s. for 54 hours, refusing the compromise of 50 hours with no advance. The offer made by the masters was rejected, as well as the amendment of 53 hours for 30s. It was resolved to strike for 50 hours pure and simple, with no advance of wages. Three hundred men turned out in the morning, and their decision was received with loud cheers.

THE BUILDING NEWS.

LONDON, FRIDAY, DEC. 8, 1871.

THE ILLUSTRATED EDITIONS OF VITRUVIUS.

AS the only author of antiquity whose writings upon the art of architecture have come down to us, the text of Vitruvius is especially valuable, and it is not surprising to find that, since the invention of printing, editions of his works, to the number, probably, of over a hundred in all, have from time to time appeared. The "editio princeps," printed at Rome by George Herolt, under the superintendence of Sulpitius, is without year, place, or printer's name. Its date probably was as far back as in or about the year 1486, and as both this and the two following editions, the one of 1496, printed at Florence, and the other of the following year, printed at Venice, are, with the exception of a few geometrical figures in the Venetian edition, without illustrations, we do not propose to examine them further. To a monk named Jocundus we owe the first illustrated edition, which was printed at Venice by "Joannes de Tridino *alias* Tacuino, Anno Domini MDXI, Die XXII. Maii" to quote the colophon.

Before describing this work, we may pause for a moment to explain the way in which our attention was first directed to the writings of this author. We have always been great admirers of old books, and have taken every opportunity of becoming possessed of works relating to architecture; but we soon found that for two very important reasons we must confine our collection within some limits even closer than this one subject, for firstly it was too expensive a task for a young architect, and secondly we could not find room for our treasures. We thereupon set to work solely to collect editions of Vitruvius, and having now got together a very complete series of the various editions of his works, we wish to impart to our readers some of the information we have thus gained.

To resume our account, then, of the edition of Jocundus. We had not been collecting very long before we came across the following entry among the bargains offered in the catalogue of a second-hand bookseller:—

M. VITRVIVVS PER IOCVNDVMSO LITO CASTIGATIOR FACTVS CVM FIGVRIS ET TABVLIS VITIAMI LEGI ET INTELLIGIPOS SIT.

This is a most singular jumble of wrongly-divided words, which any Latin scholar will at once disentangle, and which pretty fairly represent the aspect of the words as they appear on the title-page of this edition, set up in beautiful old Italian capitals, within a floriated border.

The drawings which Vitruvius himself prepared to accompany his manuscript have not been handed down to us, and their nature, therefore, in many instances is a matter of pure conjecture. It is amusing to trace through the various illustrated editions the modifications undergone by the quaint old woodcuts which Jocundus prepared with so much diligence and care, to the number in all of 136. It is strange, also, to find how many of his successors founded their figures upon his, and instead of endeavouring to correct his error by a comparison with the text, merely took his rude woodcuts and put into them a little more detail, to suit the improvements in the art of wood engraving.

The first illustration in the book is given in explanation of the reference by Vitruvius in chapter I. to the use of caryatides. He tells us that the inhabitants of Caria, a city of Peloponnesus, who were at peace with Greece, joined the Persians in making war against the Greeks. The Greeks were victorious, and in return for the treachery they had experienced they destroyed the city of

Caria, and after killing all the males, carried the women into captivity. These latter were not suffered to remove their finery and ornaments, and were not only led in triumph, but doomed to perpetual slavery. The architects of that day sculptured them in their public buildings bearing heavy loads, that they might remind posterity of the punishment of the Carians. We have translated this passage in order to show how slight is the description of these females, and the insufficiency of these data for any illustration. Now, on contrasting the figure given by Jocundus with that of Cæsarianus in the first version of Vitruvius, printed at Como in 1521, our readers will see what we mean by one author improving upon the illustrations of his predecessor, and will understand the extent to which fancy has been resorted to in order to reproduce the drawing, if there ever was one, given by Vitruvius.

We have strayed sadly, however, from the description we were about to give of the first copy we came across of the folio edition of 1511. We went off at once, of course, to our friend the bookseller to have a look at the book he had so conscientiously described, and sure enough found the folio, but it was in a very sad state, alas! and book collectors will, we are sure, sympathise with us when we explain that it had been barbarously cut down in binding; that some wretched boy (there were such boys, we grieve to say, even in the sixteenth century) had blackened the faces of all the masters and workmen in the book in ink, which had faded, it is true, but had sent an iron stain through half of its pages, and that finally some industrious little worm had burrowed right through and through the volume, regardless of the learning he was leaving behind him. It is scarcely necessary, perhaps, here to remind our book-buying friends never to send for any second-hand work from its mere catalogue description. If you are nice about your books go and look each work carefully through yourself before you part with your money, and take with you, if possible, a collation obtained from some copy elsewhere.

But we are talking more about books than Vitruvius. As we made it a rule in our collection to get a copy of any desired work, if not too costly, even in a bad state rather than go without one, we carried away our treasure, though we have long ago replaced it by one in a far finer state. The edition of 1511 contains 123 folios, and a full copy measures 12½ in. by 8½ in. The illustrations are very rudely cut wood blocks. The first of them we have already described, and the only other which claims special attention is a representation of a ship, with a machine for measuring distances on the reverse of folio 104, and explained in Book X., Chap. XIV. When we come to mention the corresponding figure of this machine in the Como edition of 1521 we will describe the origin of this illustration.

The next edition of Vitruvius, a small octavo printed at Florence in 1513, is illustrated with reproductions on a reduced scale, and still more rudely executed, of the designs of Jocundus. This work, according to Gwilt, is "extremely scarce," and it is stated by the same authority to have been sold at an auction for eleven guineas. Two copies in a fine state are before us as we write; one of them contains a pencil note to the effect that it was sold at Lord Stanley's sale for £11. This edition does not seem now to command so high a price as formerly. We have come across four copies during the last few years; the tallest of them measures 6½ in. in height, and is in its original binding. The title, which is contained within a floriated margin, reads as follows:—"Vitruvius iterum et frontinus a Jocundo revisi reformatique quantum ex collatione licuit. The entire work contains 239 folios, and the illustrations, consisting, as already stated, of reversed copies of those of Jocundus, are of little importance. The caryatides before alluded to, by a slight oversight on the part of the

wood engraver, appear in this edition to be suspended by their heads to the entablature, as they have literally nothing to stand upon, not even the conventional line. This figure is here also the first in the book, and is found at p. 3, while the ship occurs on page 177. The cuts are the worst in any of the illustrated editions of the author, and some of them, notably that on the reverse of p. 6, are upside down. At the end of the work, when perfect, is the treatise of Frontinus, "De Aqueductibus Urbis Romæ," and a voluminous index.

In 1521 Cæsar Cæsarianus, who was one of the architects employed in the erection of Milan Cathedral, produced, with the assistance of Benedictus Jovius, the first translation of Vitruvius. This magnificent folio work, which we cannot but regard as one of the greatest triumphs of the art of printing in the early part of the sixteenth century, was printed, as already stated, at Como by Gotardus de Ponte. Gwilt says of it that it is "exceedingly rare," and this statement we can endorse, as we have never come across it in this country. Our copy, brought from Italy, is of unusual size, measuring no less than 17½ in. by 11½ in. The title is too long to reproduce here; the work consists of 192 folios, and there are 117 illustrations. Neither this edition nor the one of 1513 is in the art library at South Kensington, though we believe they are to be found in the library of the Royal Institute of British Architects.

The illustration relating to the caryatides we have already described; this block, which occurs on folio 6, is the first wood-cut, and the very curious representation of a vessel which appears on the reverse of folio 174 is the hundred and fifteenth illustration. It is inserted to assist the reader to comprehend a contrivance explained at considerable length in the text whereby the distance passed over either by carriages or ships is registered by means of a train of wheels, which liberate after a certain number of revolutions, corresponding with a certain distance traversed, a ball. At the end of the journey these balls are collected and counted, and serve to show the number of miles that have been travelled over. Perrault, in a foot-note to the edition of 1684, proves that this invention would not do for vessels, as the number of revolutions would bear a variable proportion to the speed of the ship. The woodcut is very curious as giving an almost exact representation of the then undreamt-of paddlewheel. Much more curious, however, are some of the other illustrations, notably those of the plan and sections of Milan Cathedral on folio 14, and the vecta and reverse of folio 15, and the strange hieroglyphic on folio 92, where the figure of Fate is depicted with a pair of bellows, and the cherubins, in lieu of children's faces, are mainly represented as the winged heads of various animals. The drawings of Milan Cathedral would delight the heart of many a student of Gothic proportions; everything is enclosed in squares and triangles, which we will hope were not drawn after but before the building was designed. The triangles seem to have the disadvantage we have noticed before when this figure is applied to Gothic buildings—viz., of very nearly, but not quite, coming in everywhere.

If ever there was a Gothic manual of Classic architecture this must be the one. We think it quite impossible to have handled the Classic rules of Vitruvius in a more genuinely-Gothic spirit; this may be seen even in the treatment of the caryatides. Think of those gracefully-draped Grecian damsels against S. Pancras Church, borrowed by the brothers Inwood from the Erechtheum at Athens, and compare them mentally with the flowing-robed ladies depicted by Cæsarianus. Could there be any greater contrast? We should like to engrave a score at least of the illustrations to this Como edition, but, alas! it is impossible to reproduce them without mutilating our treasured volume. In 1522 appeared a reprint of the Quinta edition of 1513, with the

same blocks for the figures, which needs no further description. A counterfeit or pirated copy of the Quinta edition, without place or printer's name, was produced in the following year, and is said by Gwilt to have been in all probability printed by Will Huyon, of Lyons. We must leave the subject here for a while, though we hope in a future paper to be able to notice some of the other editions, which contain numerous matters of interest.

A COMPREHENSIVE DRAINAGE SCHEME.

MR. BAZALGETTE, the chief engineer of the Metropolitan Board of Works, who has carried out the metropolitan main drainage, proposes to establish a Thames Sewerage Commission to construct main drainage works for that part of the Thames Valley lying between London and Windsor, and embracing something like forty towns and villages, within an area of 100 square miles, the population of which is 300,000. The sewage of all the places that now drain into the Thames above Hammersmith, the extreme point of the metropolitan main drainage system, and up as far as Hampton, is to be conducted by gravitation through sewers to Hampton, at a considerable depth below the surface, where it will be lifted by pumping engines to a higher level, and flow again by gravitation through a second main sewer on to Chertsey. The places to be drained into the first main sewer are Acton, Chiswick, Ealing, Hanwell, Brentford, Isleworth, Barnes, Mortlake, Kew, Richmond, Twickenham, Mitcham, Merton, Malden, Morden, Wimbledon, Teddington, Kingston, Hampton, Esher, Thames Ditton, Molesey, Walton, and Weybridge.

The sewage of these places having been concentrated at Hampton, pumping engines are to lift it into a second main sewer, through which it is to flow on to Chertsey, receiving in its course the sewage of Southall, Norwood, Heston, Hounslow, Hanworth, Sunbury, Laleham, and Shepperton.

Other main sewers, commencing at Eton and Windsor, would bring the drainage from Windsor, Datchet, Old Windsor, Horton, Colnbrook, Egham, and Staines, also by gravity, to Chertsey, where a regulating reservoir would be formed, and a second pumping station would raise the united volume of sewage to a reservoir commanding and at the head of a tract of land of about 3,000 acres, having Chobham on its western boundary, Ottershaw-park on the east, Horsell on the south, and Gracious-pond on the north.

It is stated that the purification of the Thames is at the present time not only a matter of urgent importance, but also of pressing difficulty. Over four millions of money have been spent in order to divert all sewage from its waters within the metropolis, and in 1866 and 1867 Acts of Parliament, known as the Thames Navigation Acts, were passed, of which one principal object was to secure the early removal of sewage contamination from the river throughout its whole course. This legislation, it is well known, was the result of the settled conviction entertained by the public and by Parliament that it is an absolute sanitary necessity that sewage should be kept out of the drinking water supplied to the inhabitants of the metropolis.

The Royal Commission on water supply reported in 1869 in favour of the Thames as a source of supply, on the faith of this legislation being carried out. They said that the river Thames, supplemented, if necessary, by works for storing the flood waters, together with the river Lee and the water obtainable from the chalk to the south and south-east of London, as well probably as from the Lower Green sand, will furnish a supply sufficient for any probable increase of the metropolitan population; and that when efficient measures are adopted for excluding the sewage and

other pollutions from the Thames and the Lee and their tributaries, and for ensuring perfect filtration, water taken from the present sources will be perfectly wholesome and of suitable quality for the supply of the metropolis.

The difficulty of disposing of their sewage has, ever since the Thames Navigation Acts were passed, perplexed the many towns and villages situated in the valley of the Thames. With the stringent provisions of these Acts assailing them on one side and no efficient means of disposition presenting itself on the other, their situation, it is said, bears truly something of the nature of a dilemma. Mr. Bazalgette thinks that the exigency of the occasion can only be met by a combined and comprehensive scheme.

The cost of this great scheme is estimated at £630,000.

The money is proposed to be borrowed on the security of the rates, at $3\frac{1}{4}$ per cent., redeemable in sixty years. The rateable value of the towns and villages the sewage of which is proposed to be utilised in this manner is £1,000,000 at the present time. The present population of 300,000 is more by one third than it was ten years since. Estimating the future population to be provided for on this basis, it is supposed that in thirty years' time it will be 600,000.

Assuming the money borrowed on the terms mentioned, the first year's outlay will be as follows:—

Interest on £630,000, and one sixtieth part paid off annually	£34,913
Pumping, maintenance, and management	6,000
	£40,913
Return from irrigated farm, 3,000 acres at £8...	24,000
	£16,913

This sum would be raised by a rate of 4d. in the pound on the rateable value we have named. But as the population and the rateable value of property increase, so would the rate decrease, and it would decrease also by reason of the debt being lessened year by year, until its extinguishment in sixty years, leaving, then, an unencumbered estate in the possession of the inhabitants of the district. Thus

In 5 years from the completion of the works the rate would be reduced to	$3\frac{1}{6}$ d.
In 10 years	$2\frac{1}{4}$
In 20 years	$1\frac{1}{4}$
In 30 years	$\frac{1}{2}$

These are the features of the scheme prominently put forward, and they certainly look very well at a glance; but it will have to be remembered that these works, costing £2 per head of the population, are the main arteries only of the system, the works necessary to bring the sewage into them being in addition to these. But, perhaps, that which detracts most from the credit of the scheme is that it is proposed to exclude all rainfall from these main sewers. It is said that "The Thames Conservators, having interdicted the overflow into the river of storm waters mixed with sewage, it will be necessary in this, as in any other scheme of drainage, to exclude the rainfall from the local sewers, excepting in such towns and villages as are so circumstanced as not to infringe the above restriction of the Thames Conservators, and in such towns and villages ordinary storm overflows from the existing sewers would suffice." But this latter little drop of comfort will not be of much avail. The system of drainage that has been adopted in most of these towns and villages that are drained at all is one which admits into the sewers the rain that falls upon the area occupied. It is not now the question whether this is the proper system or not, but it has been adopted, and, indeed, it is the system adopted by Mr. Bazalgette himself in London, to this extent—that he admits into

the metropolitan main sewers all rainfall that does not exceed $\frac{1}{4}$ in. in depth in twenty-four hours; and when storms occur that exceed this quantity he has provided that the surplus shall overflow into the river, carrying with it, of course, a portion of the sewage with which it had become mixed; but in this new scheme he says the Thames Conservators will allow no sewage to enter the river. What, then, is to be done with the rainfall? The only thing that can be done with it is to separate it wholly from the sewage and discharge it into the river by separate channels, either by the old surface drains or by new ones to be made. In the villages this may be done, but in the towns it would be very difficult. Putting aside for a moment the cost of it, let us consider how the rainfall can be dealt with. To carry out a double system of drainage, one for sewage and the other for rain water, would necessitate something more than merely taking away in one the surface water of the streets and fronts of the houses; the back premises require drainage also. The respective areas to be drained, of streets, house-tops, and back premises of houses, may be taken to be about as follows: street surface, 1; house-roof, 1; back premises to be drained, 1; so that merely to take away the rainfall from the streets would be to take away only one-third of that which must go away by the drains, and to extend the surface water drains so as to take away the whole rainfall would necessitate these drains being carried through into the back premises of the houses, in the same way as the house-drains are; in fact, side by side with them. The area here called that of the back premises does not include gardens and other undrained land, but is the paved and other surfaces from which the rainfall must go away by the drains. That which falls upon the undrained area sinks into the ground, except what part of it may be evaporated, and follows the courses of the drains and sewers and gets into them through the joints, generally; but in a system purposely designed to exclude it of course this would be prevented. But it is questionable whether it would be policy to prevent it. Is the quantity of liquid sewage discharged from the houses sufficient to carry off the solids after they have arrived in the main sewers which have comparatively flat gradients, or would they silt up? If so, it would be policy to admit an additional quantity of water into them.

STRENGTH OF BOLTED BEAMS.

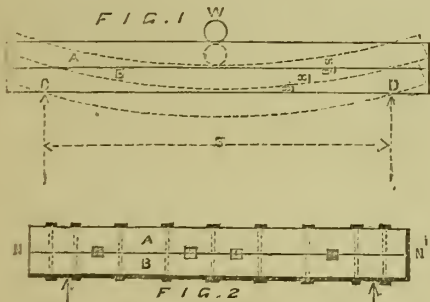
IT frequently occurs in architectural and building examples that a single beam is not sufficient, so far as strength is concerned, to support the load required to be carried. Under these circumstances, the common practice is to bolt a couple of beams together; but sometimes this is done in so careless a manner that the full strength of the combination is not obtained. This arises from the fact that the real office performed by the bolts and the effect they produce upon the double beam is not properly understood. It is often imagined that the bolts are of little or no use, and that the strength is the same as that of a couple of beams, simply superimposed one upon the other without any fastening whatever. Even when it is admitted that some additional strength is gained by bolting the two beams firmly together, the ratio or proportion of increase is but very vaguely estimated. As this is a subject of great practical importance, and one which has been scarcely touched upon by writers on construction, we will briefly investigate the chief points bearing upon the case. In Fig. 1, let A and B be two beams of timber having the same sectional area and dimensions throughout, and the same transverse strength, and let them be simply placed one upon the other with great exactitude and precision, the lower one resting upon the supports C and D, which, for the sake of simplifying the ques-

tion, may be considered to be mere points. In this position, it is obvious that if we take any points x and x' , the former in the upper and the latter in the lower beam, they may be regarded as situated the one exactly over the other in the normal state of equilibrium of the arrangement before any load is put upon it. If a weight W be now placed upon the middle of the upper beam, a certain amount of deflection will take place and will cause the beams to assume the position indicated in Fig. 1 by the dotted lines. As the weight is borne equally by the two beams the share of each equals $\frac{W}{2}$. But in this

new position the two surfaces of the beams which are in contact will have been acted upon by different forces. That of A will have been strained in tension, and that of B in compression, and the two points x and x' will no longer coincide, but be separated by a certain interval, as shown in the diagram in Fig. 1. There will be a sliding movement between the two beams which will altogether destroy that united resistance which would alone give a maximum of strength. Let b equal the breadth of each beam, d the depth, S the span, and R the radius of curvature, then if W be the load that the double beam would safely support, it will be given by the formula

$$W = \frac{4 R \times b d^2}{3 L}$$

When two or more beams are securely bolted together, and also additional precautions taken against independent action by the insertion of wedges, it is clear that the surfaces cannot slide one upon the other, and consequently the points x and x' will always remain in the same relative position. The two beams will thus act as one, at least theoretically. It is just possible that in practice this condition may not be rigidly fulfilled, but the discrepancy will not be of sufficient amount to invalidate the truth of the principle. In Fig. 2, where the two



beams are shown connected together, the line $N N'$ well represents the line of the neutral axis of the two beams, since, by virtue of the fastenings, it will not undergo any alteration in length. Consequently, as the distance of the extreme fibres on each side of this line is equal to the depth of each separate beam, the total resistance displayed is equivalent to that of a beam whose depth is equal to $2d$. But the formula in the present instance for the safe weight, representing it by W_1 , will be $W_1 = \frac{8 R \times b d^2}{3 L}$. It thus

appears that when two beams are firmly bolted or otherwise fastened together, so as to virtually constitute one single beam, their strength is double that of two beams merely placed one over the other, and the increase of strength is obviously proportional to the efficacy of the fastenings. This important point should not be lost sight of in designing double beams. It is not always sufficient to bolt the beams well together in the first instance, and then to suppose that they will always retain the extra strength thus given to them. If the beams in the permanent position in which they are placed are subjected to any jar or vibration, no matter how slight, the bolts, in the course of time, are

certain to loosen, and then the strength becomes reduced to that of two beams whose surfaces are free to move one upon the other. There is no question that to this cause may be traced the "sagging" that takes place in beams of this description, after they have been put up for some years. The practical reason for employing a couple of beams is that a single one of the necessary scantling cannot be procured, or, at least, only at a price which prohibits its employment. It is well known to architects and engineers that the difficulty of obtaining sound barks of timber of large sectional area is increasing yearly. Probably this has led in great measure to the extensive use of iron girders and beams when the span of a joist exceeds certain dimensions.

DILAPIDATIONS.—VI.

LAY.

IN the schedules of dilapidations which I have classified under the various trades, and which we have now to consider, it must be borne in mind that they are based upon the covenants set forth in page 404, and therefore any unusual or different covenants must be carefully noted, and will of course form a deduction therefrom or addition thereto. In the preceding pages the reader will find nearly every covenant explained but the following:—"And to keep the said message or tenement and hereditaments, fixtures, and premises, at all times during the said term in good and substantial repair, and in thoroughly clean and good condition. And to paint all the external wood and ironwork belonging to the said message or tenement and premises once in every five years of the said term, with two coats of good oil colour, and in like manner to paint the internal wood and ironwork of the said message or tenement and premises, once in every seven years of the said term." I am tempted to mention this covenant, because it certainly much puzzled the lay arbitrator; the various surveyors gave most varied "readings" of its value and meaning. Some explained that it merely meant keeping the walls fairly coloured and papered, and the ceilings whiteened, and the paintwork cleaned, while some contended it was a most stringent covenant, and that beyond ceilings, walls, and paintwork, it meant the washing of the floors and staircases, the cleaning of windows, the removal of dust and rubbish, and required the seeing that all those matters and things which are usually the work of the domestic servants of the establishment were done. The covenant is, no doubt, properly explained by those who held that it did not relate to these last-mentioned items.

The reader should note the explanations given in the smaller print, as they contain much that will assist him in his practice.

One point I would call especial attention to—it is the endeavour I have made to aid the judgment in determining dangerous walls by the use of figures. The result of the calculation shows that an ordinary brick wall which bulges or batters 1 in. in the foot is insecure. Unlike all the rest of my statements, this must be received only as an opinion. There is no data fixed that can guide, not even so much as there is in light and air cases, where the angle of 45 degrees does give some basis to work from.

The numbering of the tables is continued from the preceding tables.

TABLE 14.—BRICKLAYER AND TILER.

All open joints to brick flat, brick on edge coping to walls, all loose, broken, or defective tiles, all defective filletings, all defective tile creasings, external pointing to pantiling.

See if the roof has been pointed before, for it is sometimes the cases in outbuildings that the pantile roofs have not been pointed. In such instances the pointing cannot be claimed, for the reason already explained—viz., you cannot require the premises to be made superior to the original construction.

All brickwork so much out of the perpendicular, or so cracked, split, or bulged as to render them unsafe or incapable of being effectually repaired.

It is very difficult to give exact figures to guide the decision as to when a wall is so much out of the perpendicular as to be unsafe, and all the authorities leave the practitioner to decide for himself; but as this necessarily leaves so much to individual judgment, I have endeavoured to give some data to guide. Suppose a wall 40 feet high, upright for 20 feet of its height, and overhanging at the top 1 ft. 8 in.; this gives an inclination of 1 in. in the foot, which may be taken as so far out of the perpendicular as to be unsafe in ordinary brick walls. Take the same diagram and draw the wall overhanging only one-half—i. e., 10 in. In this case I should say the wall is not so far out of the perpendicular as to be unsafe. Next make a section to a large scale of a wall 80 ft. high, battering or overhanging half an inch in the foot from the base to the top, and the rule will be still found to apply. It would thus be a good rule, perhaps, to adopt—safety where only half an inch in the foot out of perpendicular, insecurity where in excess. But this rule must only be used as guide, and in helping to form a decision, as at present it is not an accepted dogma.

Split or broken chimney pots, loose chimney pots (must be refixed), all open joints of brickwork, broken brick paving, defective and sunken paving, foul drains, cesspools (which require emptying), all accumulations of earth, soil, and rubbish; sash frames and door frames, pointing to same where defective.

TABLE 15.—SLATER.

Slates, if loose, broken, or defective.

As already mentioned, it will be wise to test that the nails are not rusted or otherwise defective. The reader will do well to refer back to those observations.

Where timbers, laths, or boarding, broken, sagged, or otherwise defective, the slating or tiling must be taken off to enable the reinstatement of the former to be properly done, and then the slating or tiling must be properly relaid.

Ridging, if defective or deficient.

Shelves, slabs, pavings, if broken, loose, and, as to the latter item, if out of the level.

TABLE 16.—CARPENTER AND JOINER.

All woodwork decayed or injured by the admission of weather.

It will be well to see especially that the purlins, or the feet of the rafters, are not so injured.

Any broken timbers of any kind.

All timbers injured by dry rot.

All timbers (joists, rafters, &c.) where out of the level or perpendicular, provided the same arises from decay or neglect.

Broken laths.

Loose, broken, or decayed weather boarding.

Wooden gutters.

Water trunks.

All boarding to dormers, roofs, gutters, flats, &c., if decayed or sunk.

This latter dilapidation will be met by the words "take up and relay sunken parts," &c.

Skylights if decayed.

All sashes and frames where cill decayed, sash-lines, broken or missing, beads deficient or broken, pocket pieces defective, bars cut, rails decayed, where tenons gone and mended with angle iron.

NOTE.—In the report of the select committee on dilapidations they give it as a dilapidation if sash-lines are broken only in the strand, but in my experience this is not generally the practice; so long as the sash-line will fairly fulfil its functions, it is usual to pass it.

Doors and door frame; split panels in doors; any injury to stiles or rails by removal of locks or fastenings. Treads of stairs where nosings much worn or broken.

This dilapidation will be met by "new nosings to treads," unless the treads be wholly defective, it will then require "new tread." Where, as sometimes will be found, the tread is so worn that the top of the riser becomes used by the foot, no question should arise in the mind of the surveyor, it being so obviously a glaring dilapidation; as the riser is being used for a purpose foreign to the original and usual intention. One is led to mention it as a recollection of instances of practice occur to one's mind.

TABLE 17.—MASON AND PAVIOR.

Copings, if broken or defective, if displaced by any settlement.

It is usual where there are broken stones to allow the broken parts to be squared off, and thus only find fresh stone to complete the length. This, where the coping is of great length, will much lessen the expenditure necessary to satisfy the covenant. Be sure and take all copings, those of gables and chimneys, if any, as well as parapets.

Curbs and channels if broken or defective. Same remarks apply as to the copings; in addition such stones must be reinstated as do not afford proper fixing for the ironwork.

Sinks and sink stones if broken or defective.

Steps and landings, external and internal, if broken or so much worn as to be dangerous in passing up and down; if nosings broken.

REMEDY.—The rule obtains to allow the piecing, where this can be done in an efficient manner, to broken portions of steps. Where nosings are broken or treads are worn down to the extent above mentioned, then such piecing will require to be thus done: cut out the upper surface and fill in the depth of the nosing with a slab of the same kind of stone of sufficient thickness to form a new nosing.

Walls or other masonry if loose must be refixed.

Paving, if loose or sunken; if broken, deficiency of stones to be supplied.

Chimney-pieces, if broken, or chipped, or stained.

Stains must be removed.

Hearths and back hearths, if broken, cracked, or sunken. In latter case all that will be necessary will be the taking up and relaying.

Pointing if decayed or joints open.

Cramps if defective or deficient, or the lead running be defective.

Ashlaring and all other stone work, if broken or pieces out through frost or other causes, or otherwise materially damaged.

It is important to remember that all stone work (whether plain or ornamental) of every kind may be made good by filling in pieces of the same kind of stone wherever this can be done in a sound and efficient manner.

TABLE 18.—PLASTERER.

Ceilings, if cracked, bulged, or stained.

If not very bad, it will be sufficient to require the same to be washed, stopped, and whitened. If very bad, then defective parts must be cut out.

Walls, if the plastering be loose or bulged, that part must be cut out. Remember this will necessitate fresh papering or colouring.

Enrichments, mouldings, skirtings, and cornices, if defaced.

A hint here may be well. Look if any of the enrichments be deficient; it will often be found that some have fallen down and never been replaced.

Cement work of external fronts and other external work, as copings, cornices, trusses, caps, cills, plinths, stringings, and dressings, reveals, &c., if cracked, blistered, bulged, or broken away.

Cement paving—if cracked, sunk, or not having the original fall to allow the water to run off.

Concrete paving—the same remarks apply.

TABLE 19.—PLUMBER AND ZINC WORKER.

Lead or zinc gutters or flats or flashings, if loose or damaged, cracked or deficient.

Properly soldering the cracks will satisfy the dilapidation of cracks in lead and zinc work, provided so doing will make good sound work. The gutters will require taking up and relaying where the boards or bearers require reinstating to enable that to be done.

Flashings, ridges, hips, valleys, aprons, dormer tops and cheeks, cisterns, cistern heads, rain-water pipes, sinks, and all pipes, if loose, deficient, cracked, or damaged.

The same remark will apply here as to the preceding items.

Water-closet apparatus, soil pipes, traps, safes, pans, pumps, &c., if out of order must

be made to fulfil their respective uses. Water-closet pans must be cleansed, if necessary.

TABLE 20.—PAINTER.

Painting external, if wood or iron, stone, compo, or other work, is being injured.

It is an undisputed dilapidation if it can only be shown that external wood, iron, or other work is being injured by the omission of painting. Even without reference to the point of painting at certain periods as irrelevant here, it is certain all the decisions make it positive that where external work is exposed through the absence of paint—*e.g.*, where decay is arising—it is a dilapidation, for that which damages the estate permanently must be waste or dilapidation. Call it what you will, it is an injury to him whose estate the holder has only an usufructory right of; and therefore if permanent injury can be shown, it is no answer even to say, "Well, it has been painted during the prescribed term," and there can be no stronger mode of expressing this liability. The estate must be upheld, and if from peculiar circumstances, as from the aspect and exposed position of the premises, the paint is not so enduring, and the usual covenants only are inserted in the lease as to painting, it is no answer to say *covenant complied with*, if wood rotting, or other work being injured by exposure.

Painting internal, if not painted according to the covenant—if not in proper fair condition where no covenant.

In the Report of the Committee of the Royal Institute of British Architects, they say where no especial covenant for internal painting, *no internal painting can be demanded*, except in cases of misuse, and those of renewed wood and other works. I cannot understand how they arrived at this decision, for it is wrong, and mars an otherwise good report. In differing from such a decision it will be wise to quote specially the decision adverse to the report; it is, "Monk v. Noyes," 1 Car. and P., 265, and will be found already recited where I have explained in a foot-note how erroneous this is.

Remember that wherever any kind of work has been previously painted, painting can be again demanded; for example, a compo front may originally have been so left, or may have been coloured, but if it has since been painted, and is defaced, or by fluxion of time the period has arrived for repainting external works, it must be again painted; and it will be no answer to this requirement to scrape the cement work and colour same.

I end this table with a suggestion to the inexperienced, that they will do well when surveying works to see how dilapidations have been executed, to notice whether cracked panels and other defects, which should be rectified by the joiner, have been *puttied up* and painted over to hide defects, because, if so, in a few months' time the old sores will become again exposed, and so their clients naturally will be dissatisfied.

TABLE 21.—GLAZIER.

This is extremely simple. The rule is in inferior rooms that all squares of glass having more than one crack, in the best rooms all squares having any cracks (see page 404 *ante*) and all broken squares, are dilapidations.

It is therefore only necessary to measure the size and take note of the quality of the glass.

Puttying and back puttying to glazing if defective.

Lead lights if loose or damaged.

REMEDY.—Reinstate the bandings and cementings where necessary.

TABLE 22.—SMITH AND IRONMONGER.

Iron railings, and gratings, if defective.

Gates, if hanging or fastenings imperfect.

Rain water pipes and shoes, gutters, cistern heads, if defective or deficient.

Iron doors, shutters, and frames, linings to doors, locks, latches, hinges, bolts, bars, &c., if damaged or defective, or broken, must be made to act and work properly, and the deficiencies be supplied.

Beams, columns, ties, and supports, if defective.

Railings to internal staircases if defective or broken.

Balconies and balconets, if defective or unsafe.

TABLE 23.—PAPERHANGER.

Paper, if loose or torn or much soiled. Where the papering is hung on canvas and the canvas is torn, the canvas must be first restored. In judging of soiled paper it will be necessary to determine whether the injury arises from neglect or misuse; because if not no claim can be sustained.

Paper, if not papered in accordance with the special covenant in lease.

I think the foregoing tables will enable the surveyor at all times readily to determine all the points (if the preceding chapters have been carefully read) that can arise in his practice.

B. F.

THEORY OF THE ARTS.

ARCHITECTURAL COMPOSITION.—PLASTIC MATERIALS AND ARTIFICIAL COMPOUNDS.

(Continued from page 386.)

THERE is a large class of substances that demand consideration in treating of the materials used in architectural composition which may be briefly designated under the above head. They may be regarded in a two-fold aspect, namely, constructionally and decoratively. The progress of inorganic chemistry has done much towards placing the composition of this kind of manufactured material on a reliable basis, but chemical analysis has not advanced far enough to give us any but approximate data as to the effects of various agencies on such substances, and we are left pretty much in the region of experiment and empirical knowledge.

Perhaps in no other branch of the architect's educational course is the importance of a chemical knowledge more important or manifest than in this one of analysing or combining substances forming compounds of this sort, and of understanding the action the atmosphere and its gases have on them when used in building. Rocks, clays, sands, and soils are all of a compound nature, and enter materially into our constructions. Chemical decomposition is the only means of getting at the ultimate and constituent elements and properties of such substances. Thus in limestone we have first by the action of heat a decomposition, or the evolution of lime and carbonic acid, both of which can be again by powerful means decomposed, the first into a metallic substance, calcium, and the latter, or the acid, into carbon and oxygen—these being the simple elements whose combination and behaviour we should be perfectly cognisant of. The physical properties of mortars and cements are too well known to require repetition here. Inasmuch, however, as these cements are an important vehicle or substance in construction, it may be as well to note their characteristic qualities. Carbonate of lime is the basis of all cements, and this is found in large masses in all parts of the world in the various forms of marble, limestones, chalk, and coral. When subjected to heat in a kiln such limestone parts with carbonic acid and water, leaving quicklime, which, being slaked and combined with water, forms a friable hydrate of lime. Being mixed with sand and gravel to the extent of two or three times its weight, this compound is sufficiently adhesive to unite the surfaces of bricks or stones. Such is ordinary mortar, the induration of which is caused by its gradual reabsorption of carbonic acid from the atmosphere—a slow process, but the hardness which such mortar acquires in the course of time is, in many cases, marvellous, as exhibited by the mortar of many ancient samples. Such cement, however, only acquires this property in dry places. In moist situations or under water, another substance is needed, known as hydraulic

cement. This is composed of clay (silicate of alumina) combined with limestone in a certain proportion, and such a composition has the property of solidifying under water, the hydrate of lime combining with the silicates and forming an insoluble substance. There are many calcareous clays or argillaceous limestones used, and the time of hardening such cement depends on the proportion of clay used, the larger the proportion, as 20 or 25 per cent., the quicker the drying. Parker's or Roman cement is composed of a similar admixture. The well-known and powerful cement known as the Portland is made from the above described carbonate of lime mixed with the argillaceous deposits of rivers running over clay and chalk, pounded together under water, and dried and burnt. The strength or tenacity of this cement is too well known to need comment, being nearly four times stronger than any natural kind, or than Roman cement. The mud of many rivers passing over calcareous rocks may be used with advantage, although chemists have not been able to account for the great disparity in the results observable in similar proportions of calcareous and argillaceous ingredients. Experiments conducted on a large scale and before scientific men have shown the wonderful tenacity or cohesive strength of this cement. A block of Portland cement 16in. long, having a sectional area of 16in., or 4in. square, when supported at ends and loaded in the centre, broke at 1,580lbs.; the cement was four months old, while a similar block of Roman did not carry one-fourth that weight. Its tensile strength was found also to be nearly double that of Portland stone itself. No more valuable application of cement to construction can be instanced than its use as a concrete or in forming beams, by combination with brick or similar material. Every practical man knows the value of concrete in building. The great strength of a mass of this cement incorporated with sand and gravel or fragments of bricks and like substances makes it useful in a variety of forms, and the application of concrete in the building of walls or as a solid substratum in foundations is especially noticeable as an important feature in modern construction. The admixture of this cement with different proportions of sand and fragmentary substances has frequently been subject to experimental tests which have sufficiently proved the value of such concrete. Brick beams constructed with this cement have borne extraordinary weights, and compared with Roman cement a ratio of $2\frac{1}{2}$ to 8 has been assigned to it from actual experiment. Beams, arches, or vaults, constructed with tiles, flat or hollow, well bonded in cement, offer numerous advantages compared even with timber and iron in some instances, as where lightness and non-conduction of heat or cold are desiderata. Iron may often be employed to give increased rigidity to such concrete construction as hoop iron bands. A species of hollow pot or short tube cemented together to a domical arched form has been used successfully, the hollows serving admirably for ornamentation of some light or plastic material as wood, carton pierre, or plaster, besides the great essential of lightness of structure. What could be a lighter and more economical covering for a church or hall than one constructed in such a manner, the ceiling being of thin wood to give resonance? I think cement beams, or outside window heads, &c., may be introduced successfully in place of stone, or even brick arches set in mortar, and be infinitely less liable to unsightly fractures through settlement, &c. For columns and compressive action also cement may be used, the resistance of good Portland cement to crushing being considerably greater than Portland stone. Puzzuolana, a substance composed of volcanic ash mixed with quicklime, forms a most insoluble compound of great durability as an hydraulic mortar.

The decorative use of cement or stucco has been largely developed; more so, perhaps,

in an age when brick manufacture and taste were at a lower ebb than now. As a protection to inferior brick, and as a non-porous surface, nothing can be better (as attested by many examples) than Portland cement. It readily admits of moulded, or simple stamped ornamentation, though its too facile plasticity has in the hands of some been vulgarly employed, as I remarked in the case of cast iron. Such use has thrown a sort of discredit on composition which will require a century to efface. I repeat that its use as a non-absorbent material for facing walls, and as a cheap substitute for stone or brick architectural dressings when its nature and character are properly expressed, is quite legitimate; and as much architectural taste or feeling may be shown in it as in other materials; but used as a disguise to bad construction, or as a means of making only cheap ornamentation, nothing can be more offensive or distasteful. The latter employment of it has marred its virtues, which will, however, I believe, before long, and when brick ornamentation has been allowed to outrun moderation, be thoroughly revealed. Another group of substances, called plasters, of which the base is sulphate of lime or gypsum, may be noticed here. After gypsum has been calcined and mixed with water, a true hydrous sulphate of lime is formed, the crystallisation and expansion of its parts becoming rapidly formed, thus admirably fitting it for casting in moulds, for which purpose it is largely used. Plaster of Paris is such a material, and its use in casting is well known. The property of gypsum of parting readily with its water of solidification, and again reabsorbing it, is the principal cause of its use. Keene's, Martin's, and Parian cements, and common stucco are well known substances, formed essentially of the same basis mixed with other chemical ingredients.

G. H. G.

ARCHITECTURAL ASSOCIATION.

THE third ordinary general meeting of this Association for the present session was held on Friday evening last, Mr. Rowland Plumbé, F.R.I.B.A., President, in the chair. The minutes of the last meeting having been read and confirmed, the following gentlemen were duly elected members of the Association, viz.:—W. W. Cocker, A. Sulman, J. Wager, T. Biller, H. Spurrell, S. G. Halberg, F. W. Dalton, J. Brown, and C. J. Jones. Mr. Quilter, Hon. Sec., next drew the attention of the members to a Class which has been formed for the study of the works of M. Viollet le Duc. He stated that the class would be conducted in a similar manner to that pursued in the Classes of Construction and Design, and that it would not be necessary for each member of the class to possess a copy of the "Dictionnaire Raisonné." The class is to commence on Wednesday next, the 13th inst., when the article "Construction," in the "Dictionnaire Raisonné" will be the subject for reading and discussion.

Mr. WYKE BAYLISS, F.S.A., then read a paper (of which the following is an abstract) on

THE THREE SCHOOLS; OR THE DISTINCTIVE AIMS OF CLASSIC, MEDIEVAL, AND MODERN ART.

The author observed that there was, perhaps, no sentiment more real amongst lovers of art than that of reverence for the great masters of the Classic and Medieval schools. Nor was that reverence to be depreciated. Without a reverential spirit nothing great could be accomplished; but we should reverence intelligently. If Polykletus was greater than Michael Angelo in ideality, Michael Angelo was greater than Polykletus in fervour; but that implied that an excellence was conceivable that should surpass both. There was, again, no feeling more strong amongst thoughtful men than that if pure religion demanded some sacrifice in art, the sacrifice must be made. That was, no doubt, true, but it did not follow that the sacrifice was demanded. To all other workers the great things accomplished in the past were encouragements for the future. The painter alone was trained in the idea that for him the past only was glorious. To all other thinkers, liberty of religious thought was the very breath of life. The painter only was taught to look with a lingering regret on the time when the gods or the saints reigned supreme in the studio. It was a great thing to look back and reverence and learn, but not thus did the great

masters gain their inspiration; it was a greater thing to look forward; this should be the attitude of the modern school. Great as was Greek art in its eclecticism, and Medieval art in devotional fervour, the difference between their excellence and that of the modern schools was a difference of kind rather than of degree; and in the broad human sympathies of the religion with which it was allied modern art had everything to hope for and nothing to fear. Art had been defined as the expression of ideal beauty under a created form. The realisation of the beautiful was the aim of the artist. As the Evangelist studied the Divine goodness and translated it into generous action, as the philosopher searched for the truth and translated it in his formularies, so the artist sought the beautiful and translated it in his works. The profound thought and noble aspirations of the great philosophers seemed to reach as high as the human mind could reach without revelation; and great in heroism and intellect, the Greeks achieved great things in art—things unsurpassable until their heroism was surpassed, their intellect excelled; and yet their work was not perfect unless the human frame was perfect humanity without the soul. The Apollo was a sublime realisation of swiftness, grace, power, the Hercules of strength, the Venus of womanly beauty, but they were passionless. Actæon was unmoved either at the savage assault of his dogs or the vision of the beautiful goddess; the Laocöon was calm in the horrible coils of the serpent; and the gladiator died in the arena with a lip exquisitely arched, and a brow untouched by any of the fierce passions of the heart. And this coldness of Classic art reflected the coldness of the religion; there could be no love in the worship of Jove, there could be no jealousy for the honour of Venus. And yet the legends of the Pantheon were capable of an eclectic gloss. The story of Adonis, as Arnold told it, was full of pathos and beauty; he was the sun in his summer and winter course, his time of triumph and his time of defeat, yet in decay finding hope and renovation without end. Thus he became the emblem of human life. To the philosopher such an interpretation might have been possible, but even the intellectual could not kindle the divine flame of love, and to the masses this Pagan worship was wholly sensual. And to the philosopher succeeded the sophist, the materialist, the cynic, the sybarite, and then the end. Classic art was not overthrown by Christian art. The early Christians, a poor and despised sect, had no schools of art; they carved rude records of their faith and love, but they were not sculptors; they painted inscriptions very precious to us, but they were not painters; they turned the caves and rocks into temples, but they were not architects. Not until the Church became dominant did Christian art exist as a school, and that was centuries after Classic art had perished, burnt up with the fire of sensuality as the sacrifice was consumed, not with the flame of God's acceptance, but with the blasting of His wrath, consuming sacrifice and priest and people. Margaritone might be called the forerunner, Cimabue, Giotto, the Van Eycks and Massaccio the evangelists, and the great masters of the fifteenth and sixteenth centuries the apostles of Christian art; and in the works of those painters were to be found an unity of purpose and a coincidence of aim that revealed the leading characteristic of the Renaissance. That was emotional expression, and was traceable to the influence of the Christian religion. The expression of sorrow or pain seemed abhorrent to the Greek artist. But when Christ's life had to be painted, His life made perfect through suffering, that suffering met the painter at every turn. That was a new element, and for its sake ideal beauty was sacrificed and the real set aside. The versatility of Angelo, the impetuosity of Tintoretto, the patience of Carlo Dolce, were bent to the same purpose—the realisation of passionate expression. But in that passion there was danger as well as strength. The sensuality of the gods was more than paralleled by the morbid passions of the saints. The saints on canvas, like the gods in marble, degenerated. The coldness of Classic art could not keep it alive; the passion of Medieval art could not keep it pure, and in its corruption what a degradation it reached! Catholic art sank to the making of painted images, to be dressed in muslin—images as grossly idols as those of Greece or Rome, but without the beauty that almost blinded the moral sense when we looked upon the Apollo or Venus. Like Classic art, the Renaissance came from inherent causes. Like the early Christians, the Reformers had to fight for better things than art; but they beat out the bigotry of superstition, and brought in liberty of thought and action. Even the rough work of the iconoclasts helped the artist. It was as though the Divine Master, walking through the schools, had said, "Children, ye do not honour me thus; neither is this healthful to your souls."

It was as though he had struck out the distorted sketch and broken the imperfect model. But what was the issue? The painter found that there was another world, wherein was beauty without sensuality, and passion without suffering or sin. Filled, as people's eyes had been, with visions of earth and seas and sky, quiet lakes and streams, or storm and tempest, sunny corn fields, Alpine passes, stately cities, country lanes, rocks, rivers, trees, pale moonlight, sunsets of golden purple—remembering such visions, they could not but wonder at the utter neglect of landscape art by the elder schools. It was the scholasticism of art that kept men in one beaten track. The masters had gathered their ideas from the one great source; the disciples were but schoolmen. But when the altars went with the sacrifices and the altar-pieces with the altars, the painter was driven to the fields, there to learn for the first time how precious were all the works of the Creator. It was a new thing when Paul Potter took his canvas out of doors, and as the cattle munched the clover and gazed drowsily into his face, to paint meadow and cattle simply as he saw them. But this love of Nature was the strength of modern art, and it became a passion with the painter when Turner, at the end of his sad life, stole away to find a quiet place where he might creep out upon the roof and see the sun rising or setting beyond the river he had loved to paint, and where he might die with no face between his and the blue and gold and purple of the heavens. There were many types of beauty—the beauty of delicacy and grace, the beauty of strength, the beauty of swift unerring power and intellectual development; and all these types the Greeks realised. The Mediæval school added yet that of the saint. S. Sebastian, pierced with many arrows, was no Adonis, yet there was a holy fire in his eyes that the Greek never knew. S. Catherine, ready to be broken on the wheel, was no nymph for a satyr's lust; but her sweet face showed us more of heaven than we could see in all the gods of high Olympus. But extreme beauty, or heroism, or saintly virtue, did not make up the sum of life. There were rough hands and warm hearts to be ranked neither with the gods nor the saints; there were such heroes as Burns's cottar, Goldsmith's village pastor, Hood's sempstress; and modern art, in its great breadth, included them all. And once more, as painting followed after poetry, as Angelo and Raphael followed Dante, so the reformed faith reached the painter through its writers, leading him from narrow traditions of art (where he was himself model, and student, and teacher) to Nature, where he might learn for ever, building again the temple of Art—not as a throne for ideal beauty, or a cloister for the devotee, but with foundations as broad as God had himself laid them in creation. For like as the word written was the revelation of the Truth, so Nature was the revelation of the Beautiful; and as scepticism or superstition was the forsaking of the first of these, and carried with it its own retribution, so the heresy of the Classic and Mediæval schools—the forsaking of Nature—was visited with the same poetical justice. Greek art sank to the materialistic; Catholic art sank to the conventional. This love of Nature had been the strength of the poet in all ages; and as the painter realised it, he would be strong with the strength of Homer, who, with his choir of singing-boys, sang from house to house the immortal verse that in his blindness must have been inspired by other than material beauty; and with the strength of Milton who, although to him also the earth lay in darkness, made our rough language splendid with visions of the unseemly world. In this appeal to Nature there was safety as well as strength. Scepticism would bring back the coldness of Classic art, but without the Pantheon it could not give us another Phidias or Polycleus. Superstition was ready to restore the passion of the Renaissance, but it had no promise of a Da Vinci, a Titian, or a Raphael. But true art should rise for ever higher. It might be that we were but in the darkness with out-stretched arms trying to touch the hand of the Divine Master. But led by Him, fulfilling its legitimate purpose in the development of man, giving its glory to God and not to another, Art would never perish until its landscape was forgotten when we walked the fields of Paradise, its architecture when we reached the city that hath foundations, and when, instead of painting heroes or saints, we should look upon the face of him—their Master and ours.

A long discussion ensued, in the course of which Messrs. Pain, Loudsale, W. F. Potter, Elkington, Florence, S. F. Clarkson, Francis, Hewitt, and the Chairman took part; and the thanks of the members having been unanimously accorded to Mr. Bayliss for his paper, that gentleman briefly replied to some of the criticisms put forward, and the proceedings terminated.

THE NEW LAW COURTS.

(From the Times, December 6, 1871.)

THE amended designs for the New Law Courts, noticed by us three months ago, have now given place to finally settled designs, and, in the hope that another quarter of a year will see these superseded in their turn by the Altogether New Designs, we come to the subject again, if only to repeat the very obvious remarks we made before. Since we last wrote, Mr. Street has for the second time retouched his work, and for the second time with some effect. He has purged it of several fantastic little nothings, and has shown us that in a front broken up horizontally and perpendicularly at every few yards of its height and length, it may be possible to get rid of the ridiculous, but that it is utterly impossible to achieve the sublime, or to achieve anything higher than that admired disorder which seems to be the sole and coveted ambition of a style of architecture which may be termed the promiscuous Gothic. But we wish, and we make bold to say the nation wishes, for something more than this in the New Law Courts,—for something more than a crowd of towers and turrets and chimneys; for something more than an exuberance of fantastic ornament—a puzzle of pointed arches, of zigzag courses, indicating corkscrew staircases; for something more than a front of over 500ft. pierced with 150 windows and only one small church-like door, supplemented by two staircase wickets. We require our Courts of Justice to be worthy of their builders and their purpose. To vote millions and to allow an ecclesiastical architect to indulge his fancy to the top of his bent is not enough; we must take care that we have an edifice the conception of which is in some consonance with the use to which it is to be devoted. The exterior of such a building should at once suggest its interior application. It should not only rise in stately magnificence, but its magnificence should be clearly overwritten with the purpose to which it is dedicated. It is not enough to perch a statue of Justice herself on the principal gable. The goddess should pervade her temple. Who would not prefer to see the details and outline of the architecture of such a building frozen into some severity rather than flowering into mere prettiness? Its front should tower above the commotion of the busy street in august grandeur. Its lines should be few, effective, and harmonious, instead of many, purposeless, and conflicting; its design and proportions should be such that a glance would be enough to gather their scheme and beauty; whereas, in this Strand front by Mr. Street, the study of an hour cannot unravel the one or discover the other to be anything but a frivolous exuberance of detail, in which the real power of a man of genius has idly frittered itself away. The successive emendations of these designs only show us that though it may be possible for them to rise on stepping-stones of their former selves to better things, it is not within their nature to rise to the best thing, to the thing with nothing less than which those in authority have any right whatever to ask the public to be contented.

One fatal mistake underlies Mr. Street's designs. He has given us a huge mass of buildings, whereas what we wanted was one noble building. The very worst characteristic of the architecture of our day seems to us to be a fatal fertility which causes an architect to aim at a thousand things at once, instead of endeavouring to perfect some one harmonious idea. Mr. Street's learning in Gothic architecture is great, and he seems to have designed these Courts expressly to show it. He has collected doorways, towers, windows, gables, and galleries from all over Europe, and has incorporated them in a building which is a heterogeneous collection of parts, and which by no amendment can be fused into a whole. One of his advocates tells us, and we quite believe it, that "there is not a feature from ground to topmost finial for the treatment of which a precedent could not be found in the secular buildings of the Middle Ages." But, we submit, our New Courts should be something more than a magazine of precedents. The Venus of the Capitol is, doubtless, a collection of precedents. Her forehead, her chin, her arm, her breast, were doubtless copied from different models, but this is not to the praise of the statue. Its praise is that the sculptor, while exactly copying Nature in the details of his work, has produced a whole which is as much his own as though he had imagined the form of every limb, in which every line is beautiful, far more because it stands in exquisite and harmonious relation to those around it than because it exactly resembles something which may be found in the human figure. Can Mr. Street, or anybody else, look at his half ecclesiastical, half domestic line of build-

ings, and say that he has even attempted to reproduce Gothic art as the sculptor of the Venus reproduced Nature? He has strewn his knowledge ingeniously and intricately over a front of 500ft., but he has given us nothing about his knowledge—nothing, as we said, but a magazine of ill-assorted precedents. Mr. Street has industriously copied Gothic at its worst. He has gone out of his way in search of ugliness. Whatever may be the precedent for sinking the false roof and window of his vaulted hall between heavy towers, and giving the lesser gables each its pair of like excrescences, it is not one to be copied. The gables which flank the great window are exceedingly mean and pitiful, but the extinguisher-shaped towers on either side of these are, perhaps, the worst feature of the building. The only thing which can be said for them is that there is almost a boldness and grandeur in their positive and repulsive ugliness. We might lay our finger on many other details, but these have been pointed out by our correspondents, and our objection to the designs lies deeper than any detail. We protest against this building, or rather this confused mass of buildings, being erected, because, whatever may be its inner arrangement, its outer form is not that which we are ambitious enough to require for our Courts of Justice. As we have said, so we say again, we refuse to be content with a chaos of ill-distributed masses of weak and confused outline, without form, and full of nothing but freaks of detail. We refuse to be content with an alternation of giant and dwarfish ugliness. We require something more than even the picturesque, we require positive beauty, we require pure and noble form, exalted dignity, majestic, but not monotonous unity. We require the grandeur and the grace of lines which prolong and repeat themselves, lines which the eye may rest upon and follow. We do not require nooks and corners, queer recesses and queerer protuberances, foisted upon us with their pedigree of "secular" precedents; but we require a building of a fair and goodly front, along which from end to end shall be written as clearly as though in letters a yard high: "These are the Courts of Justice of a Great Empire."

It is said by some that the broken-up exterior of Mr. Street's design is owing to the conditions under which it was prepared—that is to say, that he was required to find such and such accommodation, and has found it as best he could. Are we, then, to understand that the exterior of the Law Courts needs to be deliberately sacrificed to the interior, or in other words, that the architectural genius of the country confesses itself vanquished? We thought it was ever the pride of a great architect that, however bound by the conditions and requirements which the necessities of the site and purpose of a building imposed, his genius had but to rise up in its strength for the fetters to fall from him. We thought it was these very conditions which often spurred him to an effort in which he surpassed himself, surpassed what he would have performed had they not existed. If we are mistaken, let us understand that we are mistaken. If we are to be offered this excuse, let it be clearly put forth, and then we shall have something to say to it. But we do not really believe for a moment that Mr. Street or his friends will stoop to such an excuse.

We cannot quit this subject without noticing some passages in an address delivered before the Royal Institution of British Architects, by Mr. Thomas Wyatt, their President. We would let them pass if it were not that Mr. Wyatt has boldly quoted them in justification of himself in a letter which we have published. Mr. Wyatt expresses "regret that Mr. Street's Strand front is so broken up into various and, perhaps, disjointed parts;" and, at the same time does not scruple to express his trust that in case the House of Commons should reject this design, and should call for new ones, "our profession will not have sunk so low, or be so lost to a sense of its own honour, as to permit any member of it to enter on such a competition." Speaking before the same assembly of the severe criticism which some of Mr. Street's brother architects have passed upon his designs, the President of the Royal Institute of British Architects asks, "Where is the *esprit de corps* of our profession, when such flagrant violations of etiquette are tolerated?" The plain meaning of these passages seems to be that, in their President's opinion, the Institute, as a body, should become a sort of trades' union, and place a restraint on the expression of opinion and action of its members, with the view of securing Mr. Street and other architects in a like position, against the exercise by Parliament and the public of freedom in criticism and action. It is hardly credible that such a man as Mr. Wyatt should thus have stood up in his high place and have opposed the etiquette of his profession to the public good. In one breath, he regrets a

design "so broken up into various and, perhaps, disjointed parts;" in another he calls upon his brother architects to stand by Mr. Street in forcing it down the throat of the public. But we would remind Mr. Wyatt that the public has an *esprit de corps* as well as his profession, and that in speaking in this fashion from his Presidential chair he commits a "flagrant violation" of an etiquette which is sovereign over that of any Institute whatever. But we are as sure that his brother architects will not endorse his ill-considered phrases as we are that, for the sake of them, the public will not stand by and see their money squandered upon buildings which are nothing but a pile of ill-assorted precedents.

There is as yet no practical consideration whatever to prevent the substitution of a new design. Every endeavour is being made to complete the drawings, nearly all the quantities are taken out, and by the beginning of the new year contracts for portions of the building will probably have been invited. If the purpose of this haste be to let the contracts before Parliament meets, and so further pledge the nation to this plan, we can only remind Mr. Street that he may chance to find the truth of the proverb, "the more haste the less speed." The contract now in course of execution is merely for the filling in of the excavated site with a vast mass of concrete. This contract will soon be completed, and there will be a sure foundation ready to receive whatever may be put upon it. We appeal to all who have at heart something higher than official or professional etiquette to join hands in the attempt to put something better upon this site than a front "broken up into various and, perhaps, disjointed parts." We believe that there are English architects who can do what is wanted, if they will only learn by this failure, and prune their genius of some of that fertile pedantry which causes them to compile a mass of buildings instead of conceiving one perfect building. Let us not fear the loss of a little time. The sacrifice of a few months now may be vexatious to us, but it will be the saving of some centuries to posterity. Have we no architect who can give us something worth our money and worth our admiration? We would fain show the world that the art of our time and nation is equal to the conception of a building which shall be a noble example of its order, without being a servile copy of any Mediæval or modern instance; but sooner than show the world such buildings as these we now reject, buildings in which the meanness of a mass of jumbled detail is only relieved by the monstrosity of a huge false gable, and the studied deformity of a misplaced and misshapen tower, we would prefer to commission some contractor to copy one of the Continental cloth-halls stone by stone.

SCOTT'S SELENITIC LIME.

WE have more than once directed the attention of our readers to the improved method of preparing mortar that has been introduced by Major-General Scott. We are not surprised to hear that the superior qualities of the new mortar are winning their way to appreciation and favour at home and abroad. It is used, we learn, under Mr. Street, for the New Law Courts, where its adhesive powers have been tested in a series of experiments by Mr. Colling, the Clerk of the Works. The results are very remarkable, as showing that the selenitic lime, even with a much larger proportion of sand, has, as compared with other mortar, greatly superior powers of adhesion. Couples of bricks were bedded together for the trials with the one brick laid at right angles across the middle of the other. They were left for four weeks to set, and were then tested by the suspension of weights until the bricks broke or parted at the bedding. There were eight varieties of mortar tried, and three pairs of bricks bedded with each. The mortar was in each instance prepared in a mill with edge runners. The following were the results:—With Barrow lime one part and three parts sand, the bricks parted with the application of from 105 to 136lb. The same lime, with four parts of sand, held together to 107lb. and 108lb. With Barrow lime, selenitic one part, and sand five parts, the bricks held together until 228, 269, and 354lb. had been applied. With the same lime and six parts of sand, the bricks parted with 167, 193, and 228lb. applied. The best of three trials with Lee's lime one part and sand three parts and four parts, were 137lb. in each case respectively; with Lee's lime, selenitic five parts, and six parts of sand, the bricks held together till 210lb. had been applied in one instance and 211lb. in the other. The tests are considered highly satisfactory.

THE new Oddfellows' Hall, in Rupert-street, Bristol, is practically completed. It will be inaugurated in January.

THE INSTITUTION OF CIVIL ENGINEERS.

At a meeting of this Institution held on Tuesday last, Joseph Cubitt, Esq., V.P., in the chair, Mr. WILLIAM BELL, M. Inst. C.E., read a paper

ON THE STRESSES OF RIGID ARCHES AND OTHER CURVED STRUCTURES.

The author, after adverting to his method* of constructing a curve of equilibrium for an arch unequally loaded with continuous or discontinuous weights, or under oblique pressures, proceeded to apply it to the determination of the stresses on rigid arches and other curved structures.

As the consideration of an arch of masonry was more simple than that of a rigid arch, a preliminary illustration was given by an examination of the Pont-y-tu-Prydd, an arch of small stability, with the peculiarity that its spandrels were constructed with cylindrical openings. The effect of these openings was described. To show the nature of the change of the curve of equilibrium by oblique pressure of the backing, this curve was drawn on the supposition that the backing was a perfect fluid, pressing at right angles to the back of the arch. The action of a passing load in increasing the stress upon the masonry was also examined.

The stresses of a rigid arch had hitherto been a subject of considerable difficulty, owing to the intricate nature of the mathematical analysis it was necessary to employ; and the labour of applying formulæ to trace the variation of stress from point to point was considerable. Still, before the transverse sections of arch ribs could be proportioned to the stresses coming upon them, a knowledge of this variation was indispensable.

The main object of the paper was to show that the stresses at every point of an arch rib could be determined by a diagram, and that some questions, such as where the form of the rib was neither circular nor parabolic, and when the pressure was oblique which would be almost intractable by analysis, could be readily solved.

The curve of equilibrium being the locus of the resultant of all the outward forces, the bending moment was the pressure in the direction of the curve multiplied by the perpendicular upon the tangent. The curve having been determined, the stress caused by the bending moment could be ascertained, and this, added to the uniform compression, was the total stress at any point. By shifting vertically the positions of the points of the curve at the crown and springing, the stress could be indefinitely varied, and the curve could be made to satisfy the conditions of the rigid arch of invariable span, or the rigid arch with the ends fixed.

These conditions were then investigated, and gave the following results. The neutral line of the arch rib having been divided into equal parts, and the bending moments at each of these parts obtained from the curve of equilibrium, when the ends were fixed the sum of all the bending moments had to be made equal to zero; when the rib was of invariable span, the sum of the bending moments, each multiplied by the vertical ordinate of the point to which it corresponded, had to be made equal to zero; and when the ends were fixed and the rib of invariable span, the above conditions had both to be satisfied. When the section of the rib changed from point to point, each bending moment was to be divided by the moment of inertia of the cross section corresponding to it, before entering it in the summation. It was then remarked that where the curve of equilibrium touched the surface of the rib, the compressive stress was doubled, trebled or quadrupled, according as the section was I or box shaped, tubular, or of the form of a solid rectangle. For vertical forces only, the bending moment at any point was equal to the horizontal thrust multiplied by the length of the vertical lines between the curve of the rib and the curve of equilibrium.

A mathematical investigation was entered into for a circular rib, considered as a voussoir arch, or rigid arch with the ends fixed, in a similar manner to Mr. Airey's treatment of the circular rib of invariable span. It was shown that the stresses could be equally well ascertained by diagram as by mathematical investigation. When a moving load was the only force acting on an arch rib, the curve of equilibrium was two straight lines, meeting in an apex vertically above the load. As the load moved, the locus of this apex depended on the condition of the rib, as to whether it was rigid, or in the state of a voussoir arch. The action of a uniformly-distributed load was then examined, and the circular rib compared with the parabolic. It was remarked that a straight or curved girder might be considered as an arch of any rise, but without any horizontal thrust,

* Vide Minutes of Proceedings Inst. C.E., Vol. XXXI., pp. 145-148.

and it was shown that, by drawing any curve of equilibrium for the weights, continuous or discontinuous, acting on the girder, considering it as an arch, the stress at any point was the horizontal thrust multiplied by the vertical ordinate.

The action of oblique forces was then entered into, and the case of the curved gates of the Victoria Docks was examined.

The stresses on the elliptical caissons used in the foundation of the Thames Embankment were next ascertained by construction. It appeared that when the eccentricity of an ellipse under normal pressure was small, the curve of equilibrium was nearly a circle, whose radius was the mean between the length of the major and minor semi-axes of the ellipse; and that if a boiler, which was an arch in tension instead of in compression, were not truly cylindrical, there would be considerable transverse in addition to the tangential stress, and if the deviation from an exact circle were greatest at the riveted joints, the stress would be greatest at the weakest parts. It was then remarked that at an ordinary lap joint, or at a part where the deviation of form amounted only to half the thickness of the plating, the stress at the surface of the iron was four times that due to the uniform pressure of the steam. This result, which showed how greatly a boiler might be weakened by an imperfection of form too slight to be detected by the eye, was not, in the author's opinion, generally known. There could be little doubt that incorrectness of form, the evidence of which was destroyed when a boiler exploded, was one of the chief causes, and hitherto an unsuspected cause, of many of the boiler explosions which occurred from time to time throughout the country.

The last example chosen was the somewhat complex case of the roof of S. Pancras Station, Midland Railway. The form of the rib differed from the circle and parabola, the section varied to some extent near the springing, and as the action of the wind on the roof was considered, the question was also one of oblique forces. The curves of equilibrium for the roof, acted on only by its own weight, were first drawn. For the actual condition of the rib, namely, that of a rigid arch with the ends fixed, the curve was contained everywhere within the depth of the rib. For a pressure of wind of 40lb. per square foot, the curve showed two maximum stresses of 4.08 tons and 4.14 tons per square inch.

The arch rib had been treated as of invariable span, but real or virtual alterations of span might be caused by changes of temperature, a yielding of the abutments, and the compressibility of the arch rib itself. It became then an important practical question to determine, for wrought-iron arches, how much the stresses might be altered by a small alteration of the span. The method of ascertaining this generally was then described, and it was found that a wrought-iron rib of 200ft. span, 20ft. rise, of an I or box-shaped section, and loaded uniformly, might have the stress at the crown increased from 4 tons to 6½ tons per square inch. This would happen if the abutments each yielded one-half an inch under the thrust, and the temperature were reduced 60° below that at which the parts of the rib were put together. This result included the stress caused by the compressibility of the iron.

In order to draw the elastic curve of the rib, it was then shown how to find the displacements of the different points, by change of temperature, compressibility of the metal, and action of the bending moment. The deflection of the crown was the alteration of the rise of the rib as found by this process. Applying it to the case of the rib of the S. Pancras Station roof, the deflection of the crown was found to be 2in, while observation had given from three-sixteenths to one-fourth of an inch, so that the agreement of calculation with observation was very close.

The author proposed to measure stresses by direct observation of the extension or compression of a small length of the material of a structure. For a stress of one-fifth of a ton per square inch, the extension of a length of 50in. of wrought iron was one-thousandth of an inch, which if magnified fifty times, would be read as one-twentieth of an inch by the eye. During the testing of a structure, two microscopes, magnifying fifty diameters, with scales in their eyepieces, fixed about 50in. apart, would measure stresses of one-fifth of a ton per square inch in the most direct manner, and the stresses could be measured at the critical points of a structure.

The author thought that this method of observation might even be useful in another way, if, as was probable, inferior kinds of wrought iron approached to cast iron in the scale of their extensibility under moderate stresses. By taking an observation where the stress could be accurately determined by calculation, the quality of the iron which had been used in a structure might be ascertained.

THE NEW LAW COURTS.

LAST week, by a singular mistake of one of our lithographers (not Whiteman & Bass, we are pleased to say), a portion of our impression went out without one of our lithographic illustrations—namely, the east part of the Strand elevation of the New Law Courts. In order that no mistake may occur this week, and that every subscriber may have a copy of the lithograph, it will be issued with every copy of the BUILDING NEWS.

Since we last went to press the controversy on Mr. Street's designs has been continued in the *Times*. On Saturday last Mr. Denison, who had before severely criticised the designs, returned to the charge, and said almost ditto to what Mr. E. W. Pugin had advanced on the preceding Saturday. On Tuesday last "F. R. I. B. A." had another letter in the *Times* unfavourable to Mr. Street's designs. It would be well, however, for "F. R. I. B. A." to well acquaint himself with the facts before he speaks so positively. Of all things in the world, he quotes the BUILDING NEWS as one of the "technical journals" "unfriendly to Mr. Street's design." This is about one of the most extraordinary mistakes that could have been made. From the first we have championed Mr. Street's designs. When an almost insane attempt was made by Mr. Lowe, Sir C. Trevelyan, and the *Times*, &c., to change the site from the Strand to the Embankment, we fought the proposal inch by inch, until it ceased to have any force, and when, after an unnecessary consumption of time, it was at last decided by the Government to commence operations, we exhaustively reviewed the elevations and arrangement of the proposed building, and spoke warmly in their favour. Most people think we have spoken much too warmly. In speaking of the respective plans submitted in competition by Mr. Street and Mr. Edward Barry, "F. R. I. B. A." says Mr. Street had really only two marks, whilst Mr. Barry had forty-one marks. These marks were recorded by Messrs. Shaw & Pownall, the professional advisers who made a preliminary report. The report, however, of the law officers of the various courts and offices, consisting of judges, barristers, &c., and who may be supposed to know something of what they want, reported very differently. Of Barry's thirty-seven offices, they report nine good, ten moderate, and fifteen bad; of Street's, they report twelve good, twelve moderate, and eleven bad.

It is supposed by many, and we believe by Mr. Street himself, that "F. R. I. B. A." who has figured so prominently in the *Times* in opposition to Mr. Street's designs, is Mr. James Fergusson, the author of "The History of Architecture," &c. We beg to say advisedly that this is a mistake. Mr. Fergusson has not written a word to the *Times* on the Law Courts controversy.

VILLA RESIDENCE, CAMBORNE.

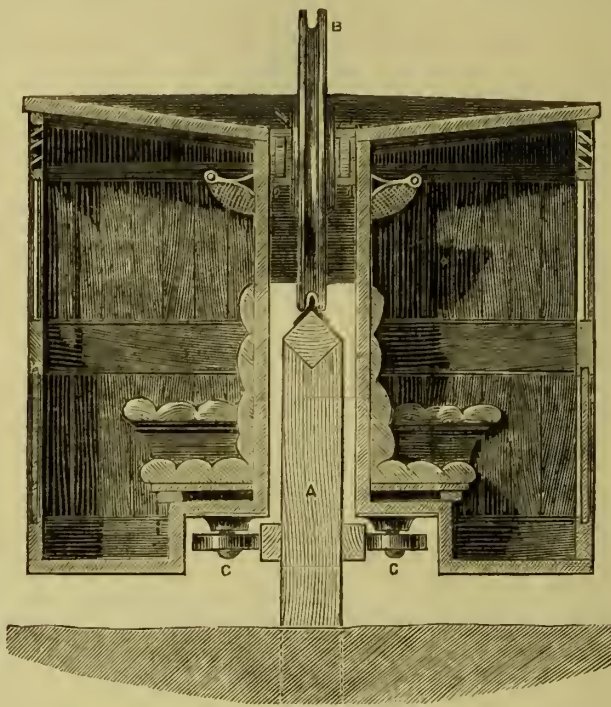
ONE of our illustrations represents a villa in course of erection at Camborne. The building is pleasantly situated, commanding extensive views of scenery, including S. Ives Bay, the North Cliffs, and the lofty hills stretching far away towards the Land's End. The principal fronts are facing south and west, and the sitting-room, which will be most used, while possessing the finest aspect, is made as light and cheerful as possible. The walls are built of local Elvan stone, hammer-dressed, having granite quoins, lintels, and sills. Other dressings are of white china clay bricks, moulded, and a rich brown brick is also sparingly used as inexpensive means of obtaining relief. The plans fully set forth the disposition of the rooms, which are quite sufficient in number to meet the requirements of the proprietor. A water-closet and garden entrance were originally planned under the stairs, but were subsequently omitted. The back stairs and passage are lighted by a lantern light, which also serves as a ventilator, so that any vitiated air ascending from the kitchen department readily escapes without being wafted through the building.

The principal rooms are completely shut off from the offices, and the means of supplying the dining-room from the kitchen will be easily understood; while the food can be rapidly passed from one to the other it would be impossible for the servants in the passage to see into the room. The upper sashes of windows in the main house have margins of orna-

mental coloured glass. The total cost, including bath, water supply, &c., will not exceed £1,350. Our illustration is from a sketch prepared by the architect, Mr. James Hicks, of Redruth. The builders engaged in carrying out the works are Messrs. Nettle & Delbridge, of Camborne.

ONE-RAIL RAILWAYS.*

IN India and other sparsely-populated countries, where the construction of roads is of comparatively little utility, because, from various causes, they are little likely to be used, and where railways scarcely ever repay their first enormous cost, some cheap means of locomotion has long been a desideratum. Mr. Haddan's "economical one-rail railway" is designed to meet this want, and the subject claims ease and cheapness of construction as its principal advantages.



The railway (see figure) is a wall about one yard high, A, and one foot thick, on the top of which a single line and sleeper is laid. The rolling stock consists of double carriages arranged in pairs, one on either side of the wall, and connected together at the top only by a roof common to both, leaving a longitudinal passage about 10in. wide between the two. In the upper part of this passage the vertical wheels, B, are arranged one behind the other in Indian file, the lower half being left entirely open, so that when the carriage is mounted astride the wall its two halves will hang down on either side. The under side of each carriage is provided with friction wheels, C C, furnished with springs, which preserve the balance by pressing against the wall on either side near its base. As in practice the load will never be quite equally balanced, one of these friction wheels, by always bearing against its own side of the wall, will effectually prevent all probability or possibility of oscillation; when the speed is considerable, the horizontal wheels will not touch the wall at all (ex. bicycle). The locomotive will consist of a pair of vertical boilers, one on either side of the wall. The horizontal wheels will, in this case, on the Fell-Vignoles system, grip the wall between them with any amount of force, and thus overcome steep gradients. Mr. Haddan asserts that the cost of the line will not exceed £1,000 per mile, and that in many instances it may be constructed for £500, and even £300 per mile.

MR. REDFORD'S LECTURES ON THE FINE ARTS.

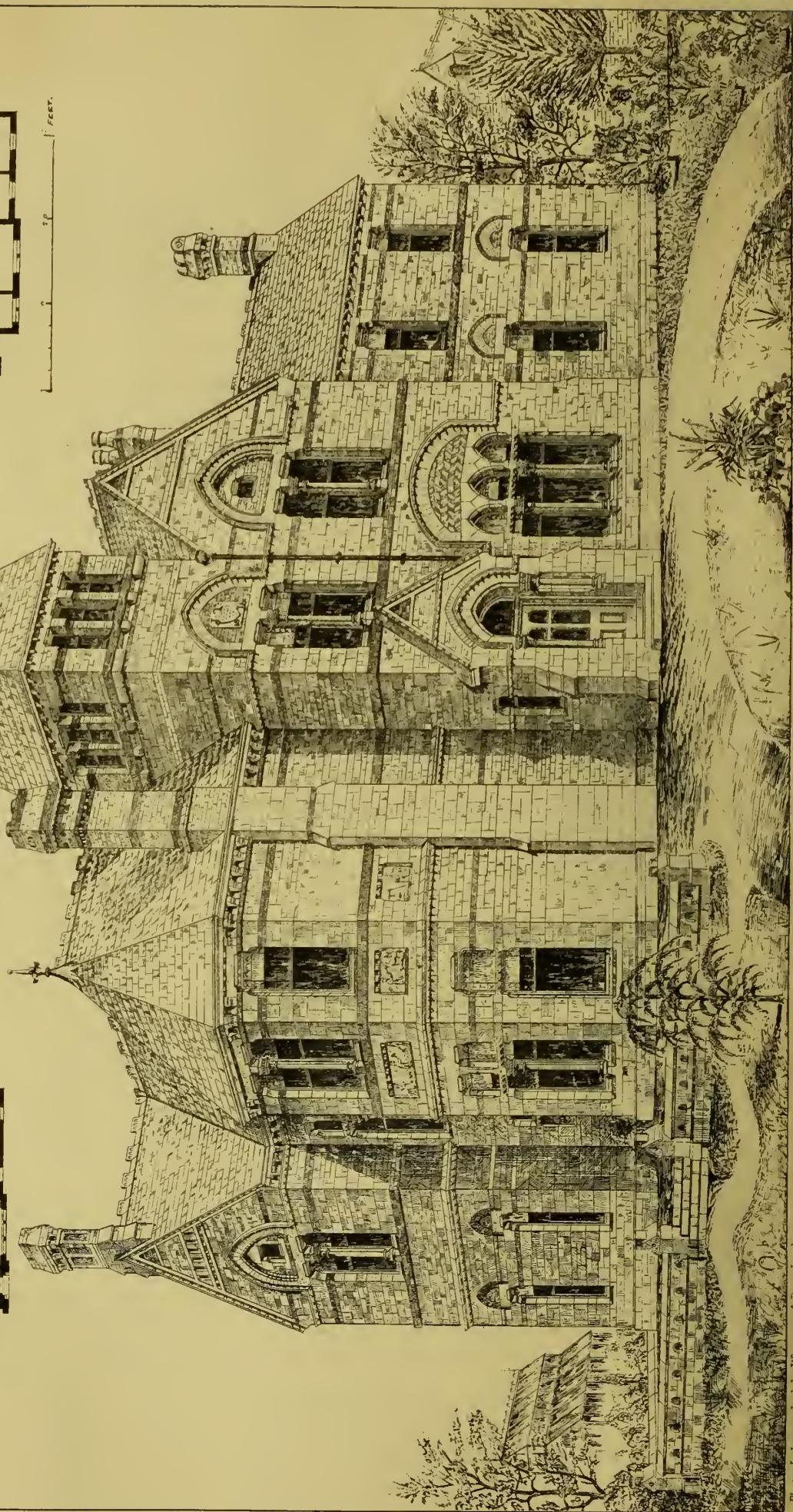
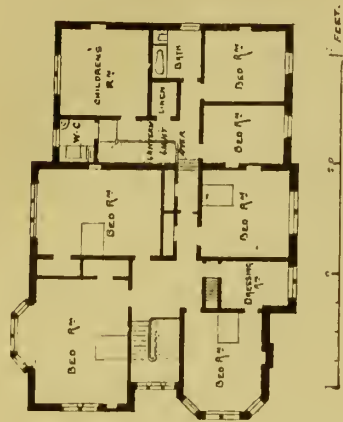
THE introductory lecture to the systematic course of twelve lectures which Mr. Redford has undertaken was given on Monday evening at the Gallery of the New British Institution, 39, Old Bond-street. The lecturer, after alluding to the wide range of subject which was embraced by the Fine Arts, and the inexhaustible interest to be found in the study, proceeded to point out the distinction between the fine

arts and the useful arts. The useful arts were necessary; the fine arts were not indispensable; but, like poetry, music, and eloquence, fine art was the outward and visible form of beautiful ideas, the expression of ennobling thoughts, the growth of ages of culture. Could all this be dispensed with? The relation of art to manufacture and the commercial spirit of the age was illustrated by the extraordinary excess of ornament and love of display to be observed in every direction in the present day, and in the splendid shops—those palaces of art-manufacture. Art-value was to be distinguished from the value of material, and it was not enough that a work of art; should be rare, curious, novel, grotesque, or quaint—it must be beautiful. The Parthenon Marbles had been protected from destruction by their art; had they been, like the other works of Phidias, made in gold and ivory, they would, like them, have perished by being converted into money. Wealth and high national prosperity were not favourable to high art; the most beneficial return that art gets from the treasury of nations was in the collection, and preservation, and exhibition of her grand works in the public galleries, open to rich and poor alike. Here we could see that beauty, after all, was above price; and that, however large the sums paid by nations, price only served to show the value of art, as the thermometer tells the heat of the sun without sharing one ray of its splendour. The course of art, as compared with civilisation, was traced, showing how art had lain dormant for long periods, while civilisation had advanced; and after following the progress of Italian art, the lecturer lamented the decadence of art that has accompanied the vast advance of civilisation of the last three centuries. In landscape art alone could it be said that art had advanced, and in this advance English artists had held and maintained the highest rank. This part of the lecture was made admirably clear by a large diagram showing by coloured line the courses of civilisation and art at different times, from the earliest date, which, according to Mr. Fergusson's chronology, might be taken at 10,000 years before our era.

The relation of art to morality was next considered; and the lecturer pointed out the fallacies of "feeling" and "bigotry" that critics might be betrayed into, and the confusion of terms introduced by those who look at moral excellence in preference to the beautiful art of a picture or statue, enforcing his remarks by quoting some of M. Taine's criticisms on Mr. Ruskin's opinions. "One of the highest functions of art," the lecturer said, "is to represent those grand fictions of the human mind which man is for ever creating out of the facts around him; just as in letters his history is sublimated into the beautiful legends and poetry of heroism and romance." Each of the expressional arts had its own mode and sphere, out of which it could not venture with propriety. If the painter attempted to preach he became ridiculous; if the actor was too close in his impersonation, he became a mimic; if the musician imitated noises, or even the song of birds, his music had no charm. Perfect beauty in art was like living natural beauty—the sum of many conditions and qualities, not one of which could be dispensed with without injury. The real could not be separated from the ideal without loss, although it was true that poetic truth was often displayed by work which was false in many ways; yet it was so far an incomplete work. In concluding his lecture, Mr. Redford observed that though he had pointed out the antagonism between art and civilisation, it was not the great wars, such as those which we had witnessed in the last 15 years, which debased art, for they increased the power of the emotions, made men serious, and formed us heroes; but it was what civilisation brought in its train—the insidious fever of wealth and social rivalry of display and self-assertion—that enervated art. He looked with faith to the native fertility of the intellectual soil of the race, its improvable, and the vast influence of literature and science, as well as to the culture of art as a branch of polite education, for any revival of the long-lost faculties of art.

* Economical One-Rail Railway for India, the Colonies and Sparsely-Populated Countries. By J. H. HADDAN. London: E. Stanford.

THE Baptist Chapel at Blisworth, Northamptonshire, has been enlarged, at a cost of £1,150.



COURTS OF JUSTICE

East part of Strand elevation

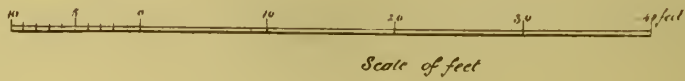


Photo-Lithographed by Whiteman & Bass London

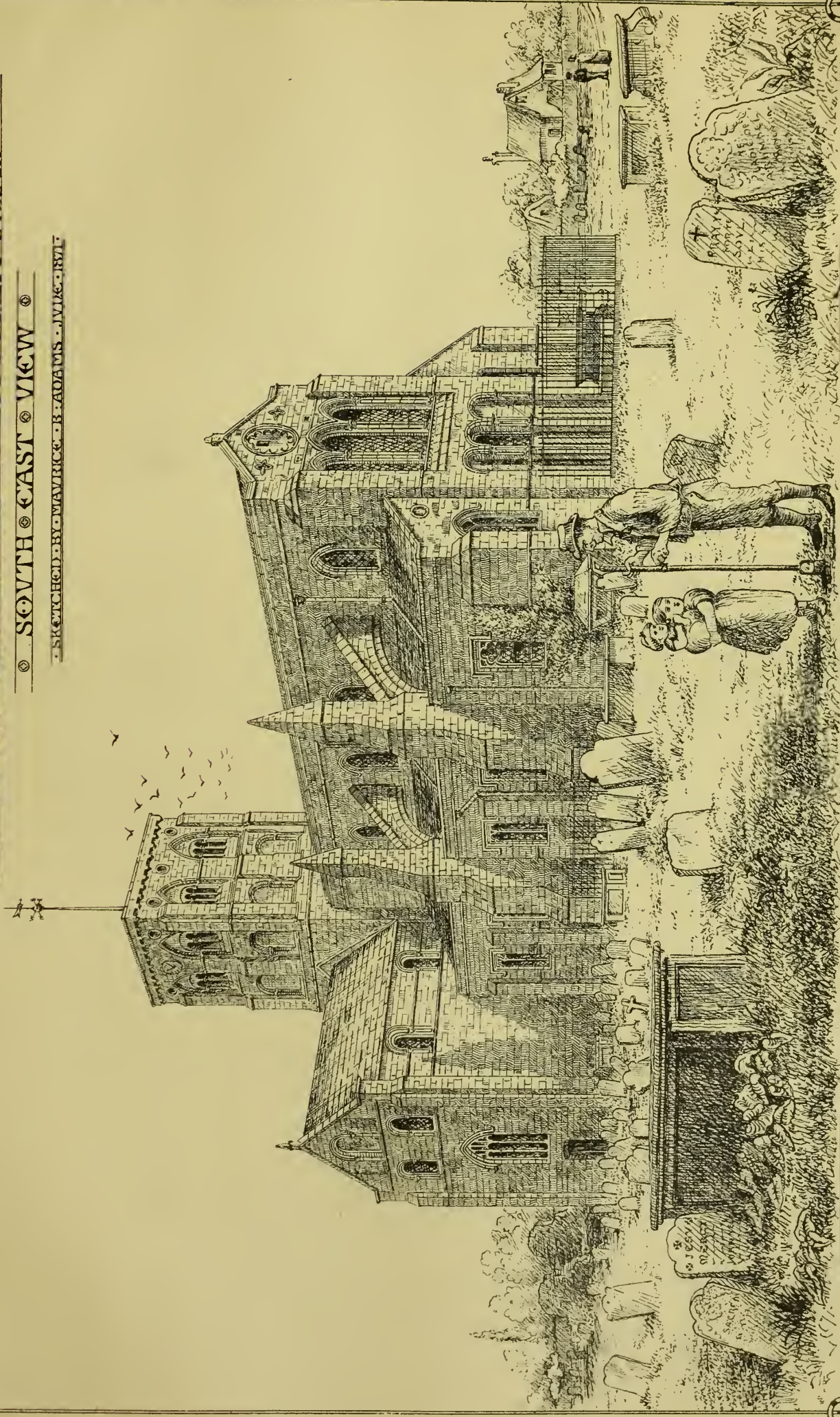
A R E A



NEW SHORHAM CHURCH SUSSEX

SOUTH EAST VIEW

SKETCHED BY W. A. RICE. DRAWN BY J. W. A. RICE. 1871.



MODERN GOTHIC AS PRACTISED,
AND THE NEW LAW COURTS.

IN the present state of things architectural, it would be, perhaps, impossible to instance anything more curious and worth the trouble of a little thought than the result of the Law Courts Competition. It is not only of interest as a thing in itself, but is the more so as illustrating a great principle at work in modern architectural practice—viz., this: How far, and in what manner, is the great idea of Gothic architecture, as conceived in past ages, taken hold of and grasped by modern men? In other words: Has the modern architect learned anything, and how much, of real Gothic art; and can he with ease, in each case, go to work, and apply it readily and truly to a modern and every-day purpose? This is a most important inquiry, as according to the answer to it that we may arrive at must be the future of Gothic. It would certainly be impossible to find anything more to our purpose than these great Law Courts and the mode in which they would seem to have been produced. We ask the attention of our readers to a few thoughts about them, and about the old Gothic from which they are supposed to have been copied—to the old mode of work, and to our modern, and, as we are sometimes told, improved system. No one, we will venture to say, certainly no Gothic architect, will dispute the axiom that the old Gothic builders knew well what they were about, and had it in them to apply readily to every purpose, whether great or small, the forms and details of their admirable style. No building, for whatever purpose intended, came amiss to them: they were equally at home in a cathedral and in a simple village church, a street of quaint houses and a townhall. Nothing can be more curious than the variety of ingenious ways in which the old builders and architects of the works met the difficulties of each individual case, without science, as now-a-days developed; without any “principles” of art, whatever that may mean; and without what is now called so boastfully “education.” They seemed to do their work almost because they were more deficient than we are, and because they lacked so much of what we have. They knew nothing but “Gothic architecture;” had no “precedent” to go by; no books to refer to; no learned lectures to teach them anything; no newspapers to record and make public their grand doings; indeed, and in short, everything that we have, and think so necessary, they had not; yet are we absolutely certain that had they had these very Law Courts to contrive, and to practically realise, they would have done the work, and done it right well, in whatever phase or style of Gothic that might have been in vogue at the time in which the work was done. No one will doubt that had we the remains or ruins of Law Courts of the twelfth, or thirteenth, or fourteenth centuries, we should find in them evidence of just what was wanted at the time—buildings conveniently and usefully planned, and appropriately and expressively ornamented or decorated; not like a church, or cathedral, or parsonage-house. No foreign Gothic forms, we are certain, would have been used or borrowed; all the details would be found to be of home thought and origin; and, perhaps, greatest lesson of all, and one which the Gothic men of the present day have yet to find out and to learn, no form or ornament would have appeared, borrowed from another building, and then simply attached to or stuck on the new structure, merely for ornament’s sake, or for the mere purpose of decorating or embellishing the building. These principles, we take it, will not be denied by any one who knows what the Gothic architecture of the past was, or who has with any care studied the remains of it. May we, therefore, by the light of them—and in this way the work may be useful—comment in a few words on the

modern system of working out the problem of the Courts of Law, and the putting up of a great building in the midst of modernised London, to be devoted to a purpose for which there is no antique “precedent,” and which it was necessary to think out primarily, and from a modern point of view? These Law Courts, then, as designed by Mr. G. E. Street, are simply, if there be any truth in the old way of work, a total and complete failure; everything is wrong, or in its wrong place, and put to a false use. No ordinary person, for instance, looking at the elevation published in the BUILDING NEWS of the west part of the Strand front, could suppose the structure at the back, with the rose window in the gable, to be anything else but the end—say the transept end—of some second-sized cathedral, with the rose window placed just where it could not be visible from the floor of the building, but only in the roof of it—a beautiful and expensive form thrown away. We say nothing of the little unmeaning details on either side of it, nor the solitary statue on the top of a cap surmounting the gable, for these are things borrowed from a totally different kind of building. The window, it is needless to say, is a church window, utterly inappropriate, and affording no sign whatever that this building is one of the most important, if not the most important, part of the whole design, and the key to it. Before we go further it may be as well to remind the reader that the architect of this proposed specimen of modern Gothic building has had some very singular and capital opportunities and advantages—good teaching under Mr. Scott, books in plenty, extensive travel, and not a little useful professional experience; no start, therefore, could well be better or more encouraging; he is also a capital and able draughtsman, so that almost anything architectural looks well and attractive from his pencil, and it seems a pity that, for his own sake, he did not take the trouble of drawing this very elevation with his own good hand, and not leave it to an assistant. We trust these reminders will not be taken in the bad sense of what Mr. President Wyatt called “personality,” for surely no real artist can feel offence at the being “accused” of doing his own work himself, and of being responsible for it, and of being thoroughly capable of the work he has to do. The reader must take everything into consideration, and do fair justice to the result by fairly estimating the means. The architect cannot forget his orthodox church and chapel practice; for, half hiding this grand cathedral elevation, there come two gable-ends, copied, we had almost said, from the stock-in-trade parsonage-house fittings, for who ever saw a modern parsonage-house without such a gable-ending as this in it? But why thrust in a bit of it here? The structure immediately in front, and in which is the comparatively small and insignificant entrance-doorway, flanked by two cathedral windows, is, in reality, a part of the elevation at the back, and belongs properly to it; and, had it not been for the gable-ends, would (in the drawing) have created a central feature, awkward and dull enough, perhaps, but still better than it now looks and promises. Of the staircases to galleries flanking this central doorway, and which is shown to a larger scale, with a plan and section, on another plate, and which shows the details clearer, very much might be said, for they show what modern Gothic is, and what modern architectural practice is, for the elaborate and showy windows, with all the accompanying details in and about them, are more important, and impress the eye more, than the windows and details of the Central Hall itself; yet are they only mere staircases leading to galleries or passages leading somewhere else. You can only see them when at the top of the stairs, and while turning hastily round to get to your final destination. This is modern Gothic! Of the little insignificant doorways and paltry

windows which you must look at, nothing need be urged, for they tell their own story. The doorways, we suppose, come from Italy; but is it wise to try and amalgamate all sorts of Gothic together in this way?—it is like talking in Italian, and English, and French mixed. The little staircases by the side of these more important ones, thrust in, as it would seem, for mere effect’s sake, only serve to show how entirely the idea of the picturesque is missed in modern architecture. Nothing can be less productive of the picturesque than the effort to manufacture it. Having got thus far, we may well ask the reader to look again at the elevation, and say whether or no this is “a building.” It is not; it is a collection of buildings, got from all sorts of places and books, put together, picturesquely as it is thought, or imaginatively perhaps; while the real truth is that it has been so done because there was nothing else mentally in view. It is scissors-and-paste architecture, and nothing more, and any one with but little or no acquaintance with Gothic forms would be able, out of a few illustrated books, to build up a structure in this poor and unimaginative way. Nay, it is worse than this, for how is it possible to be more at a loss what to do than to put a doorway torn from a cathedral into the front of a mere entrance-hall leading into a number of comparatively small rooms? What an opportunity lost! This being the central and most important portion of the whole block of buildings, and thus failing, it is surely unnecessary to say one word about the rest of the block, for it is all alike, and simply a repetition of the same notion—little and insignificant features, narrow windows, useless pinnacles, and borrowed details from all sorts of foreign buildings. Never was such a total mistake and misapprehension of the true nature of Gothic art and modern requirements and aspirations. May we, therefore, offer a few hints on this important modern problem, and on what could be done with it in competent hands, working free of modern architects’ office ways and traditions? Let us suppose, for a moment, any man with but a fair knowledge of the language, or even the alphabet, of Gothic art and architecture, and determined to throw away all “precedent,” as represented in books, sketches, and (we had almost said) in actual remains, and to go to work with his simple knowledge of this Gothic stone language, and then apply it to the work to be done, recollecting that that work is a modern work, and for which there is, and can be, no precedent to go by. Suppose, too, a little of the imaginative faculty to be ready at hand, backed up and supported by the common sense of the necessary plan of the structure or structures. Can the idea of “Law,” as it is in this age and country, be in any way symbolised or indicated? Let, in the first place, the picturesque take care of itself, which it will always be found to do if left alone, and not thought too much about. Why surely, in the very entrance-doorway itself, some idea of the place and its purpose might be indicated, some sort of expression of the Law might be shown, even some idea of its uncertainty, mystification, and unintelligibility even to those who administer it—its fell pressure and its delay! If we could but suppose for a moment that Mr. Street had had the Law in his mind when at work on the building, we might suppose that the Law’s delay was preluded by the narrow entrances, so that even to get at it you must needs wait. Something of a Dantesque spirit might get into such an idea, something of gloom and hopelessness might be shadowed forth.

“All hope abandon, ye who enter here.”

Vast gloomy portals, overshadowing roofs, and surely a “clock-tower” to record the passage of time, even of years, and to hint at the ending even of a Chancery suit. We can well imagine ourselves working with Gustave Doré at the Court of Chancery, of which Chancellor Eldon (who was born for the

work) once said that if any one but those in that famous Court was interested in it, it could not last for a single day. We think we could show something of this in stone, in walls, and doorways, and certainly with the help of sculptured forms. C. B. ALLEN.

THE VICTORIA PALACE OF AMUSEMENT.

SOME couple of months ago that intensely popular place of entertainment entitled the Victoria Theatre, familiarly known by young Englanders of the New Cut as "the Vic.," and which some fifty or sixty years ago started upon its career as "the Royal Coburg" was closed to an admiring audience, but closed only with a view to being reopened again, restored, improved, adorned in every feature and circumstance, under the imposing denomination of a "Palace of Amusement," at Christmas.

The work of reconstruction, which is of the most extensive kind, nothing but the four walls and the roof being retained, is being carried out from the designs of Mr. T. C. Robinson, of Haverstock-hill, the contractors being Messrs. Snowdon, of Paddington, and the whole being superintended by Mr. Watson, their foreman. Having personally inspected the works, as well as the plans, we find them to be of sufficient importance and novelty to warrant our giving a somewhat detailed account of them.

To begin with, an entirely new stage has been constructed, 73 feet deep, and 30 feet wide at the proscenium, which is 29 feet 6 inches high. This stage, which is 5 feet lower than the former one, is a working stage, with traps, slides, and bridges throughout the whole extent behind the curtain, with ample depth and height for all possible apparitions from aerial or subterranean regions, as the "effects" of the scene may require.

But the solicitude of the management has been more particularly directed to providing ample accommodation and increased comfort for the numerous audiences which are expected to attend. The auditorium has been enlarged by throwing the stage 12 or 14 feet back, and retiring the front of the boxes 2 feet, making an addition of some 16 feet, the total depth from the stage to the back of the auditorium being 80 feet. The width of the auditorium from wall to wall is 66 feet. On the pit floor is a promenade, or corridor, paved with stone, of about 10 feet wide, and of good height, probably some 12 feet or more, the walls being covered with silvered glass; and there is a similar promenade accommodation attached to the boxes. The ceiling is domed, 48 feet high in the centre. There is no central chandelier, the principal lighting being effected by means of a ring of gaslights of thirty-four feet diameter, external measurement, let into a channel lined with white enamelled iron. In connection with this arrangement provision is made for carrying off the heated air through the roof. Abundant provision, also, has been made for ventilation in other ways, shafts for the purpose being placed within the walls of the auditorium, extending from the basement to the open air, and communicating by means of ornamental trellis work with every floor. There are also other provisions in the interests of the health and comfort of visitor in all parts of the building which are highly to be commended. The staircases throughout are of stone, and the supports throughout are of substantial brickwork.

The decoration of the house has been designed in a liberal spirit, guided by good taste. The centre of the ceiling is panelled in white and gold, with movable medallions, capable of opening for the convenience of the acrobats and other aspiring artists who may have occasion to ascend to those regions. The coving round the ceiling is blue, with gilt stars. The ornamentation of the upper part of the proscenium is in gold upon a white or tinted ground. A similar style will prevail throughout the fronts of the galleries and boxes, the dress boxes being distinguished by festoons of flowers, whilst the two stage boxes on either side will exhibit medallions.

The house is calculated to hold about three thousand persons, more than one-third of them in the capacious gallery. So far as we can say from personal observation, the ranges of the seats in boxes, pit, and gallery appear to have been fixed with a special aim to affording all occupying them a fair opportunity of witnessing the performances without craning forward, or perching on the shoulders of those before them—a matter too much neglected elsewhere, even in our quasi "patent" theatres. The fittings throughout are well devised, and suitable to the occasion, with a due discrimination of the grades of society

occupying the various parts. The boxes are handsomely and comfortably provided, and the South London *flâneur*, if he will pay the price of a stall—we know not exactly what, but it will be moderate, we are assured—may recline for five hours in a capacious armed seat, lined with velvet.

It being now an ascertained fact that food for the mind, whether at museums, International Exhibitions, or theatres, cannot be received and appreciated without the addition of an abundant supply of creature comforts for the inner man, the management of this "palace" have taken care to provide very extensive accommodation in this essential particular. Four capacious refreshment-bars will offer the "delicacies of the season" and the choicest drinks of native and foreign growth, to boxes, stalls, pit, and gallery, upon scales of tariff adapted to the patrons of the respective departments.

The externals of the house remain unaltered, with the exception of the front, where the effect of the quaint old shallow portico has been heightened by the addition of some structural ornamentation. The arrangements for entrance and exit appear to be well provided for, the boxes being approached through a vestibule by a double stone staircase, and there being four distinct entrances to the pit. These works were undertaken at a contract price of £5,600, and they will be carried on night and day till completion. The entire management of the amusements of the "Palace" will be in the hands of Mr. J. A. Cave.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting of this Institute on Monday evening last, Mr. E. T. Anson, Vice-President, in the chair, the ordinary routine business having been transacted, the following gentlemen were elected members of the Institute, viz.:—As Fellows: Mr. William Hill, of Leeds, Mr. E. G. Paley, of Lancaster, and Mr. W. Thompson, of Old Bond-street. As Associates: Messrs. Frederick Boreham, Robert Willey, and Matthew Wyatt, (all of London), Mr. James Howes, of S. Bees, Cumberland, and Mr. H. H. Statham, jun., of Liverpool. Mr. H. Carr, M. Inst. C.E., then read a paper (of which the following is an abstract)

ON THE BRIDGES OF LONDON.

After treating of the bridges of London historically as connected with the varying circumstances of the metropolis in early and later times, the author proceeded to notice them simply as means of communication considered with reference to the localities on each side of the river, and to traffic as developed by increased population and trade. On this head he referred to the great difficulty now experienced on account of the great accumulation of business at the East-end, considered in connection with the very large traffic on the river up to London Bridge. The two great traffics by land and water, as it were, overlap. Bridge communication, he pointed out, is much wanted in the neighbourhood of the Tower; the great river traffic, however, will not admit of interference below London Bridge, except at enormous cost. High level bridges have been proposed, a tunnel has been constructed, but still the traffic from the east of London Bridge comes to that crowded thoroughfare, and there is no immediate prospect of any change in that respect. Much has been said of late years as to the widening of London Bridge, but the difficulty was not so much on the bridge itself as in the approaches; the object should therefore be to divert traffic westward as much as possible. If it be determined to widen London Bridge, it should be done so as not on any account to interfere with the general elevation; any addition by ironwork would be a barbarous proceeding, destroying the effect of one of the finest bridges in Europe; besides, such addition to the bridge would not relieve its approaches, which are as objectionably crowded as the bridge itself; moreover, as the foundations of the bridge would not admit of more weight being put upon them, this would be fatal to several plans which have been proposed. One suggestion for widening London Bridge which has been for some time before the Bridge House Estates' Committee, was shown by two plaster models exhibited by Mr. Carr; the proposal consists in thrusting the granite parapet somewhat over on to the cornice, and to make it as thin as granite will admit of being worked and fixed in safety. The footpaths are now 9ft. wide; the addition would be 2ft. 6in. on each side of the bridge, making the footpaths 11ft. 6in. wide. This plan Mr. Carr considered as the utmost that should be attempted. The great object, however, should be to lead the traffic westward to Southwark Bridge. The toll is now abolished, and Queen Victoria-street on the one side and Southwark-street

on the other have opened up good approaches to that bridge; but great hindrances to its more extended usefulness are its steep approach and narrow width. To render this bridge capable of taking its due share of traffic it is proposed to take down the existing east iron arches, and to substitute arches of wrought iron; by this change of construction the thickness of arch and road material might be reduced from 9ft. to 5ft. 6in. It is proposed also to reduce the headway underneath from 29ft. 6in. Trinity high water to 25ft., making it the same as at the new Blackfriars Bridge. The summit level of the roadway would thus be lowered 8ft., which would admit of the gradient on the south side being altered from 1 in 26 to 1 in 43, and on the north approach from 1 in 20 to 1 in 40—1 in 40 being the standard of good gradient fixed by the Bridge House Estates Committee for the new Blackfriars Bridge. In altering the arches it is proposed to corbel out the footpaths, increasing the width of the bridge from 42ft. to 54ft., thus making it the same as the present London Bridge. The nearest route from the Bank to the Elephant and Castle is over Southwark Bridge; if, therefore, the approaches were made good and the width of the bridge increased it is felt that a considerable portion of the traffic now using London Bridge might be drawn westward to Southwark Bridge. Waterloo Bridge should be thrown open toll free, but there is very little prospect of this being done at present. The rebuilding of Westminster Bridge of a width of 84ft. has provided ample accommodation there. It may be regretted, Mr. Carr thinks, that the inclination on this bridge itself has not been made a little steeper, in order to ease the approaches; the gradient on the bridge itself is 1 in 58, and the approaches 1 in 30 at the steepest part, whereas a general inclination of 1 in 43 would have been more advantageous for the road traffic, without interfering to any appreciable extent with the river traffic. The approaches have been somewhat sacrificed to the bridge, instead of the architect considering the whole as one work, and giving the best possible inclination throughout. Lambeth Bridge was built to meet a supposed want, but singularly little traffic passes over it. Vauxhall Bridge is in a good position, but the extension of the South Western Railway from Vauxhall to Waterloo Bridge, and lately the formation of the Southern embankment from Vauxhall to Westminster Bridge, have caused a very severe loss to the company. Chelsea Suspension Bridge is a valuable means of communication for residents in the adjoining localities, and though it cannot be said to take any part in the great metropolitan traffic as yet, still, as building increases, free access to Battersea Park becomes more and more desirable.

Mr. Carr next proceeded to consider the bridges of London as mechanical structures, with reference solely to strength and stability. Beginning with the foundations, he said that the original timber bridges built by the Saxons and Normans across the Thames at London seemed to furnish examples of the importance of driving the piles of such bridges deeper than was then accomplished, for they were easily washed up by floods. The defect of these piles probably led the builders of the first stone bridge into the opposite extreme—viz., making the piles too massive, and by their very mass leading to destruction by increased scour. The piles of the first wooden bridges were not stable; the foundations of old London-bridge were not altogether successful, therefore, in building the next bridge (Westminster) another plan was tried, the French system of caissons: in fact, barges in which the piers were partly built while floating, then sunk in place and the sides removed, the site being dredged to receive them. The objections to this plan are that a perfectly level bed cannot be obtained, and the caisson bottom must inevitably rest in the first instance on limited portions. Increased weight and time will no doubt produce a more even bearing, but it must involve settlement to some extent. The caisson system was adopted at the next bridge built, Blackfriars; the caisson bottoms or platforms on which the piers stood, lately taken up, were 88ft. by 37ft., and two bales and a half thick, area 3,256ft., bearing a weight of 11,241 tons, or $3\frac{1}{2}$ tons per foot super, supposing the whole area to take its share of load equally; but in fact the weight was carried by a much more limited area. The load per foot on the surface of timber area of footing was about 6 tons. Had this weight been evenly distributed over the whole bearing surface, the surface being the London clay or gravel, resting on the clay, the foundation might have been good enough as long as not undermined; but there were symptoms of the arches having yielded on the centres being struck, which leads to the suspicion that the pier foundations had slightly moved, in fact, had come to their bearing as the increased weight came on. In

arches Nos. 5, 6, and 7 from the south, lead was found run into joints on the north side, in each case the arches evidently having lurched over to the south, opening the joints on the north haunch. Lead was run in as much as an inch thick at extrados, tapering inwards, the masonry joint being tight at intrados. The opened joints were not in one course through, but stepped a course up or down. It is supposed that some four or five tons of lead were taken out, but the greater part was stolen. This system of caissons is now universally admitted to be defective and inefficient, principally from liability to be undermined by increased scour. Waterloo Bridge was the first of the bridges built in what may be called the present day—built after the date when engineering had become a distinct profession. The foundations of this bridge were of a totally different character from all preceding; no pains or expense were spared, and everything was done which at the time was considered most efficient. Cofferdams of double piling and puddle were formed, which did their work most successfully, the foundation being laid dry. Southwark Bridge followed on the same principle, and new London Bridge immediately after. Taking the case of London Bridge, the area of the pier foundations was laid dry, with cofferdams, 43ft. below Trinity high water; bearing piles of whole balk were then driven over the whole space 4ft. and 3ft. 6in. apart, cross cills were laid on the pile heads, the intervening spaces were filled in with rubble and brickwork, the whole planked over, and the piers built on the foundation thus prepared. The weight on the foundation of central pier is about 21,151 tons; supposing this to be evenly distributed over the whole of the bearing piles, there would be a weight of about 88 tons on each pile, and of course, on each cill crossing each pilehead. The specification describes these cills as either elm or fir. In new Westminster Bridge another plan of foundation was adopted, resembling that in building old London Bridge, the object in view being to avoid the expense of coffer dams. The principal bearing is on 145 elm piles in each pier, driven 3ft. 3in. and 2ft. 6in. centre to centre, and cut off below low water. These elm piles are surrounded with 44 iron piles, 5ft. from centre to centre, with cast iron plates driven between the piles, thus forming a complete casing which surrounds and includes the elm bearing piles; the interstices are filled in with concrete, making the whole solid. The weight on these piers is so slight when compared with that on the piers of London Bridge that the question of foundation becomes of less moment. The weight per pile is about 15 tons, supposing the elm piles to carry the whole weight, or about $11\frac{1}{2}$ tons, supposing the iron piles to take their share. Query, would not solid cement concrete resting on a well-prepared bed have made a more efficient and more durable foundation than piles of timber, the interstices only filled in with concrete? Homogeneity is the essence of strength; one homogeneous mass is the true foundation wherever it can be obtained. The next system of foundation introduced was that of iron cylinders open at the bottom and sunk into the bed of the river by excavating inside first by divers; afterwards, when water-tight strata are reached, by pumping out and working dry, the interior, when a sufficient depth has been reached, being filled solid with concrete or brickwork. The railway bridges at Charing-cross, Blackfriars, and Cannon-street are thus carried. Nothing can exceed the facility of putting down such cylinder foundations, and nothing can be better where sufficient area is given, and where such form is suitable to the superstructure. The weight required to sink these cylinders seems to be about 3 tons per foot of circumference, that weight including the cylinder itself and the load placed on it for driving it down. There is one very important distinction between railway and road bridges. In railway bridges the weight is always carried in the same position, and is naturally transferred on to definite and distinct points; circular cylinders placed under these terminal points of the arch or girder become, therefore, suitable foundations. But the case of a road bridge is different, inasmuch as the varying traffic is distributed indiscriminately all over; the weight and strength of the bridge have, therefore, to be distributed also over the whole width, and consequently a continuous pier is more suitable than such isolated columns as are sufficient for railway bridges.

Having given various interesting details of the rebuilding of Blackfriars Bridge, Mr. Carr said that in the upper portion of the piers of bridges there is not such scope for variety as in the construction of foundations. For the Thames, the right material, no doubt, is granite, and the best hearting is good sound brickwork. Good sound brickwork carefully built in Portland cement or lias lime is stronger work and more solid than even ashlar throughout,

but the granite facing must be well bonded in, not such work as is sometimes done—a face carried up of stone nearly of the same depth throughout. The arches of all bridges of any size or importance, up to a late date, were always of masonry; but after various examples of iron had succeeded elsewhere, cast iron was used for the arches of Southwark Bridge. In later times the manufacture of wrought iron has advanced so rapidly, and wrought iron offers such advantages over cast, that it is now almost universally used. The cast iron arches of Southwark Bridge certainly are a bold and noble construction. It is a singular and almost unique fact with regard to cast iron arches that they were in the first instance made much slighter than in later works. The bridge at Sunderland, of 236ft. span, has arches of about 46in. area of metal. Southwark Bridge centre arch of 240ft. span has arches of 6ft. depth, and 122in. area. The tendency in all other works has been to give greater mass in the first instance, and to build slighter in later times. The builders, however, of Sunderland Bridge gave their successors no opportunity of paring down; the margin of stability there was small indeed. The danger with cast iron in general, and cast iron arches in particular, is that of getting an unequal bearing either from defective fitting, or from expansion and contraction. The rise and fall of Southwark Bridge arches is about 1in. for ordinary change of temperature, or about 1-40th in. for each degree, such rise and fall must produce considerable variation in the load to be sustained by the extrados and intrados of the arches. The brittleness of cast iron, together with the improved facilities for the manufacture of wrought iron, have led to the almost universal adoption of wrought iron for arches. If one portion of a wrought iron arch, say the intrados, should from bad workmanship or other cause have more load to carry than the strength of the metal will bear, a general compression would take place in that portion, and a corresponding shortening, allowing the remainder of the arch (the extrados) to come into play before any mischief took place. Though cast iron in the dimensions usually experimented upon has probably double the power of resisting compression that wrought iron has, nevertheless it is usual not to trust to it with much more than about half the load, showing how strong is the general feeling of distrust in that brittle material. As regards oxidation, however, the balance is much in favour of cast iron, both from a less tendency to rust, and also from the same absolute amount of loss being a less percentage on the greater mass. This is a strong reason against using thin wrought plates in any construction exposed to the weather—the loss, say, of $\frac{1}{4}$ in., by oxidation would be immaterial in a thick casting, but would be fatal in a $\frac{1}{4}$ in. wrought plate. With regard to Blackfriars Bridge, the ordinary course of heating the ironwork and dipping in boiled oil was pursued, four coats of paint following. Asphaltic paint for the interior surfaces, and Torbay oxide of iron paint, finished with Messrs. Rose & Co.'s olive green for the exposed face. The great desideratum of the day, no doubt, is some means of permanently protecting iron from rust; this is now said to be done by Messrs. Turner and Allen, of Upper Thames-street: their process is to coat the iron with bronze or copper in such a manner as to effect perfect union between the two metals; if this union of the two metals really be as perfect as stated, no doubt it will prove a most valuable discovery. Having given various interesting details of the strength of materials used in the new Blackfriars Bridge, and described the temporary wooden bridge at Blackfriars, Mr. Carr, in conclusion, treated of the bridges of London considered as works of art.

A brief discussion ensued, in which Mr. G. Aitchison, Mr. Seddon, Mr. Arthur Cates, Mr. Phené Spiers, Professor Kerr, and the Chairman took part; and, Mr. Carr having replied to the remarks made, the meeting terminated.

GRANITE AND ASPHALTE PAVEMENTS.

(Concluded from page 415.)

THE transverse depressions, generally extending from kerb to kerb, and noticeable only when the pavements are wet, mark the edge of the asphalt, as it cooled when being laid, before a fresh supply was brought to continue the work, the pressure exerted by the rammers being probably greater at these points. Similar depressions are visible more or less upon all the pavement when new, and equally so in Paris; they do not affect their stability, and it seems to me that with care they might be largely avoided.

Recently I had an opening made in the Poultry, and found the thickness of the asphalt to be two inches. At another opening next the kerb, at a spo

where the deepest impression in the whole street appeared to have been made by the carriage wheels, the thickness was on one side 1 11-16th in. and on the other 1 5-16th in.; and at the same opening, but at 2ft. from the kerb line, it was 1 15-16th in., whereas the original thickness as laid was $2\frac{1}{4}$ in. As before said, this asphalt compresses under traffic, and therefore it is not easy from these measurements to state how much of the diminished thickness is due to compression, and how much to wear, but from what I have observed at openings made for various purposes at other places, and from other indications, I incline to the belief that but little is due to wear excepting immediately close to the footway kerbs.

Considering the nature of the material, the cost of its maintenance, and other circumstances referred to, it does not, however, seem probable that the asphalt can be nearly as durable as granite.

It has greater durability than macadam, and that is largely attributable to its non-absorbent qualities. The pools of water which are so soon formed upon macadamised roads of much traffic, rapidly lead to their deterioration; but water does not affect the asphalt. It has therefore been found in Paris to be cheaper, but it must be stated that there good material for macadamisation is dear. Knowing, however, the large cost of maintenance of this class of road in the heart of London, I believe that asphalt would be found to be cheaper in many places, and it is free from many of the disadvantages incidental to all macadamised surfaces in the heart of a city.

It has been remarked by the municipal engineers of Paris that gas escaping from the mains destroys the compressed asphalt, by reducing it to a state of powder; and although no such occurrence has taken place here, the casualty may be expected, if a large area be laid. But, with its foundation, it forms a pavement which distributes pressure more than ordinary pavements do, and thus pipes beneath it are less likely to sustain injury from the traffic. This consideration, however, leads, with many others, to the conclusion that subways should be formed beneath all leading thoroughfares.

The action that temperature may exercise upon asphalt has now to be considered. I was informed, both in Paris and at Geneva, that the compressed asphalt of the Val de Travers was not affected by the heat or cold. The ranges of temperature in both of those cities are greater than they are in London.

The pavement in Threadneedle-street has now been down for more than two years, during which time I find that the highest temperature at Greenwich was * 157° Fahr., and the lowest 4° Fahr., but neither temperature was observed to affect the pavement, and it does not seem probable, therefore, that the extremes of temperature in London will injuriously affect this asphalt.

The Val de Travers liquid asphalt in George-yard, Lombard-street, shows no signs of having been affected by heat or by wear; but indeed it is subject to no conditions which can much test its durability.

The Limmer asphalt in Lombard-street was opened to the traffic on the 16th May last, and on the 24th and 25th May, the highest temperatures in the sun being respectively * 151° Fahr. and 140° Fahr., the surface at places where exposed to its direct action became pliant, and wheels of vehicles, and the horses' shoes, left impressions upon it both visible to the eye and perceptible to the foot. On the first day the marks were worse than they were on the second, some of those first formed having been partially obliterated by the succeeding traffic, whilst fresh marks, but not so perceptible, had in a few places been formed. These marks are still visible in places.

The specimen in Bermondsey, early in May last, did not appear to have suffered from heat, but upon inspecting it recently I found the impressions of the wheels clearly visible upon its surface, showing that it, also, had yielded to the action of the sun. Its position is more exposed to the sun than that in Lombard-street.

A street surface which yields perceptibly increases the draught of horses, and cannot retain that smoothness which is one of the advantages of asphalt pavements; nor, being subject to such movement, is it likely to be so durable as those having greater solidity; for asphalt, from its nature, must wear speedily if its surface be uneven.

If, however, it has been successfully laid in the carriageways of Berlin, Vienna, and St. Petersburg, the temperature in those cities must have well tried it, for in all of them the ranges are greater than in London; and the softening in Lombard-street may

* Blackened bulb in vacuo placed on the grass.

possibly be attributable to want of judgment in compounding the asphalt, an error which may be corrected in future work of the company; but in none of the cities named would the traffic so test the asphalt as to afford criterion of its durability under the traffic of London; and some time must elapse before it can be said to be tested either in Bermondsey or in Lombard-street. It will be more speedily tested in Moorgate-street.

Barnett's iron asphalt has been subjected to a fair traffic in one street, and to a considerable traffic in another place in Paris. I did not perceive important signs of wear upon either of them in July, 1870; but, with the exception of that in the Rue vide Gousset, they had not been tested long.

It has been seen that the modes of compounding and forming the asphalt pavements differ materially, the one being a mineral unmixed and laid in a state of dry heated powder, the other three being composed of asphalt largely mixed with grit, sand, and other ingredients, and laid in a heated liquid state. There is, consequently, a marked difference between their structures, and I incline to the belief that the asphalts which will form the most durable pavements for carriage-ways are those capable of being laid and compressed in the shape of heated powder.

Although the traffic over M'Donnell's Adamantane pavement in Carter-lane has never exceeded 700 carriages daily, the surface showed wear at the end of the first year. In eighteen months it had to be repaired, and was recently in such a condition that I could not certify that a second instalment might be paid. It has since been further patched by the patentee, who has floated the surface with some bituminous matter which disguises its real condition.

As to the pavement with asphalt joints in Duke-street, and the contiguous pavement with lime grout joints, they are in about the same condition; but if anything, that grouted with lime shows the most wear; but the wear is in my opinion attributable to the comparative softness of the Aberdeen granite, and not to the mode of jointing.

The other specimens will require to be tested for from two to three years longer before their advantages can be ascertained; but all appear to me noisier and less pleasant to travel over than the pavements grouted with lime.

STREETS UNFITTED FOR ASPHALT PAVEMENTS.

The last point of my reference is, "As to the streets which, in his opinion, are from their gradients or any other cause unfitted for asphalt pavements."

Two causes alone occur to me which may render carriage-ways unfitted for asphalt. The first is the gradient, the second is the nature of the traffic or business carried on in the street.

The question of gradient must be considered both in respect of ascent and descent. Upon ascending an incline, the draught as compared with a level surface being greater, a vehicle has a tendency to roll backwards, a horse has to exert a greater force to draw the same load, and requires a better foothold to avoid slipping, and in descending requires a better foothold to withstand the tendency the load has to roll downwards upon it. The tendency to roll increases with the gradient of the street and with the smoothness of the surface.

Asphalt being perfectly smooth, the angle at which a body would descend upon it by its own gravity is very slight; and as it affords much less foothold than granite, it causes, even upon steep gradients, more strain to a horse, and can only be used with safety on a less inclination than other pavements.

The exact value of asphalt in this respect, as compared with other road surfaces, could only be established by dynamometrical observations, which have not, I believe, been made; and in their absence, opinion must be formed from general experience and consideration of known results on street surfaces of other kinds.

The streets in the City paved with compressed asphalt, which have the steepest gradients, are:—Old Bailey, with a gradient of 1 in 71; Queen-street, with a mean gradient of 1 in 66, a small part of it being 1 in 57; and the western end of Broad-street, which is 1 in 46. No inconvenience to the traffic has been noticed in these streets, but the pavements have been laid so recently that conclusions cannot be safely drawn from them.

One in 30 is the steepest gradient permitted to railway companies and others in the formation of turnpike roads, and 1 in 20 in other public carriage roads of less traffic, but neither of these is a good gradient for a paved town road. A horse can trot up a gradient of one in 45, unless heavily laden, provided there be reasonably good foothold; but upon such a gradient a vehicle on asphalt would run down rapidly by its own gravity. A gradient of one in 60, on a well-made granite pavement, is,

as regards traction, not much inferior to a level surface, and although I incline to the opinion that asphalt can be safely laid at a steeper gradient, I think that, until further experience is gained, it is expedient not to exceed 1 in 60, excepting under special circumstances. Speaking from general observation only, I should say that no street at Paris paved with this material has a greater gradient than 1 in 60, and that most of the streets have much better gradients.

Asphalt is fitted for all streets of suitable gradient, unless there is chance of such substances being spilled upon them as decompose or injure the material; but I am not aware of any streets in the City where such an extent of business of that kind is carried on as to render injury to the pavements from such cause probable.

Where there is much heavy cartage, or horses have to start with heavy loads, it may be better to use granite until more experience is gained, and especially in those streets where it will be difficult to maintain a high state of cleanliness.

The streets in which the advantages from asphalt will be most fully experienced are those of the greatest traffic, where the comfort afforded by it will be felt by all, whether in carriages or on foot, or in the neighbouring houses; the other streets are those in which the premises are used as offices, and where transactions of great commercial importance are carried on, of which Throgmorton-street, Lothbury, Old Broad-street, Mincing-lane, Mark-lane, and streets of similar character, are examples.

GENERAL CONCLUSIONS.

My general conclusions upon the subject matter of this report are:

Firstly—That asphalt carriage way pavements afford much convenience and comfort to the traffic, and to the inhabitants of the streets in which they are laid, and that they lessen the labour of horses and the wear of carriages.

Secondly—That, with great cleanliness and reasonable care during frost, asphalt pavements are, for the general traffic, as safe as granite; but that shortly after slight rain, and just before dryness ensues, in streets of much traffic, or when not kept clean, they are more slippery than granite, but that the duration of these periods of slipperiness is but short.

Thirdly—That great cleanliness is essential to them, that they can be kept cleaner than any other class of pavement, that the cost of doing so is not much more than that of cleaning other streets, and that with proper cleanliness street watering is unnecessary.

Fourthly—That an asphalt surface can be laid and repaired as quickly as granite, but requires finer weather for its proper execution; that when done, the work causes less inconvenience than granite; that less surface need be taken up for repairs over openings, but that the cost of the repairs will be greater than that of granite.

Fifthly—That the durability of asphalt will be less than granite, but in what degree there is no experience in this country to show.

Sixthly—That the first cost of asphalt is about the same as granite, but that the maintenance will be more expensive in streets of large traffic, and will vary according to the character of the road and the traffic over it, and that generally, therefore, asphalt will be more expensive than granite pavements.

Seventhly—That asphalt will be less expensive than macadamised roads where there is much traffic, and is free from the inconveniences of macadamised surfaces.

Eighthly—That with present experience it is not advisable generally to lay down asphalt in carriage-ways having steeper gradients than 1 in 60.

Ninthly—That asphalt is adapted to all streets having suitable gradients, excepting those in which special or exceptional trade or business is carried on, and where it may be difficult to maintain a high state of cleanliness.

To avoid misapprehension, I must again state that I have referred mainly to the compressed asphalt of the Val de Travers. My general conclusions are, therefore, only strictly applicable to that material, and but partially to the liquid asphalts of the same company, and those of the Limmer Company and Mr. Barnett.

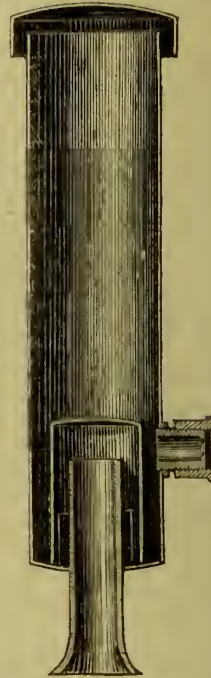
The report also applies exclusively to carriage-way pavements.

WILLIAM HAYWOOD, Engineer and Surveyor.

FERSTEL's design for the new Vienna University buildings has received the sanction of the government, and will now be laid before the academic body. The works are to commence early next year.

WESTO & PINDER'S PATENT OVERFLOW-PIPE.

MESSRS. CARRILHO PINDER & Co., of East-street, Walworth, are manufacturing an improved overflow or waste-pipe for cisterns, of which we give a sectional illustration. The object of the invention is the prevention of injurious and obnoxious gases from the drain or soil-pipe, or elsewhere, rising through the water. The waste-pipe is constructed with an internal water trap which is kept constantly but slowly supplied with fresh water from the cistern. The trap consists of an inverted cup or bell scooped out or otherwise open-worked where it rests on the bottom of the outer overflow-pipe. Inside the bell and reaching to within a short distance of the top of it, the pipe connected on to the waste union passes down through the bottom of the outer overflow-pipe. A constant flow of water is ensured to the trap by means of a regulator made in the form of a cap with milled edges, or formed as an ordinary nut, and having one or more perforations in its bottom. The inside of the cap contains sponge, felt, wool, or other porous material. The cap is screwed on to a pipe with its end plugged up, but having one or more perforations through the same. The harder it is screwed on the more will the porous material therein be compressed, and the less water is able to pass through. The pipe is screwed or soldered on to the side of the overflow-pipe. The water from the cistern passes through the perforations in the cap through the porous material in the same, and then through the perforations in the small pipe into the inside of the outer overflow-pipe and into the trap formed therein.



The principle of the invention may be modified in its details. It is, we think, calculated to effect its purpose.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

LEICESTERSHIRE ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.—The usual bi-monthly meeting of this society was held on Monday week. Several interesting objects were exhibited, and papers read on Thurnaby and Grimston Churches respectively by Mr. John Hunt and Mr. Vincent Wing.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The opening meeting of the fourteenth session of this Association was held on Thursday, the 23rd ult., when an address was delivered by the President, Mr. A. J. Blanc. In the course of his address, Mr. Blanc remarked that, compared with other years, it could not be doubted that the amount of building in and around the city had considerably fallen off during the year immediately past. Natural causes explained this. The supply, so greatly in excess of the demand at one time, had sought to balance itself; and matters had thus resumed a more natural level. This, however, so true of dwelling-house property, was not so much so of public edifices. These were everywhere rising as steadily as ever. With the increase of intercourse there was necessarily a greater commercial impetus, which, in its turn, demanded extended accommodation for its various uses, in the shape of hotels in which to reside, warehouses in which to store goods, and offices in which to transact their business. He hoped that at no distant date the Association might be enabled to offer additional advantages to those who sought assistance through it, by having an establishment of its own wherein to develop and mature those special subjects it found most useful to its members. At the close of his address, Mr. Blanc received a vote of thanks. A number of photographs and works of art, lent by Mr. David Bryce, architect, were exhibited at the meeting.

Building Intelligence.

CHURCHES AND CHAPELS.

BYWELL.—The church of S. Andrew, Bywell, was reopened on S. Andrew's day. This church, situated at a lovely point on the Tyne, was originally severed from the adjacent abbey of Hexham, and no doubt, with the neighbouring church of S. Peter, formed a missionary centre at a very early period. The church consisted, before the alterations, of a chancel, nave, south transept, porch, and western tower. The structure generally is of the twelfth century, but the tower belongs to an early Saxon date. The additions consist of a new north transept and chancel aisle. The works were under the direction of Messrs. Slater & Carpenter.

CHRIST CHURCH CATHEDRAL, DUBLIN.—The works here are going on satisfactorily. The north wall of the nave aisle has been entirely removed. It was covered with a vast mass of modern masonry, the removal of which has disclosed many interesting features. The original buttresses appear to have engaged shafts to their outer angles, and are being so restored, and some considerable remains were found of a building outside the north door. This seems not to have been a porch, as its level is far above that of the ground. It is divided into three bays east and west, each bay arcaded, and the groining shafts remaining *in situ* proved that it had been vaulted. Mr. Street has applied to the Corporation of Dublin for permission to restore this interesting building (which projects forward into the road) and this appears to have been very readily given. The restored chamber will be of two bays north and south by three east and west, the groining carried on delicate detached shafts, and it will be used as a baptistry, for which its size and shape are very suitable. It will be a great addition to the interest of the restored cathedral.

DUMBERTON.—The new church of S. Luke's, Dumbarton, from the well-considered plans prepared by Mr. R. Anderson, architect, of George-street, Edinburgh, is now in course of erection. The site is a central one, in the High-street of the town. The area enclosed forms a parallelogram 112 feet long by 56 feet broad, divided longitudinally into a nave and chancel, with north and south aisles, by piers and arches, eight on each side, supporting the clerestory wall. The chancel is a constructional one, and defined by a massive, richly-moulded arch. The piers in the nave are alternately octagonal and circular, with moulded bases and capitals. In the chancel the piers are composed of clustered shafts, with carved capitals. Owing to the peculiarity of the site, no light can be obtained from the aisles, and a well-developed clerestory has therefore been introduced. The two-light windows in the clerestory of the nave are each enclosed in a pointed arch; the single lights in the chancel clerestory, six on either side, are inserted in a rich arcade, which runs along the whole length of the wall. The east window consists of five, and the west window of four lights, in each case the head being filled with geometric tracery. Ample space is left between the cill of the east window and the floor, so as to admit of the introduction of a reredos and other suitable chancel decorations. The architect's plans also provide for a stately tower and spire in connection with the west front. Only the first stage of this will be erected at present, and it will form the vestry. A second vestry is placed at the end of the chancel aisle, as also the organ chamber. Open pews will be supplied for a congregation of about 500, the chancel being reserved for the choir and clergy. The style of architecture adopted is Early Geometric—a style well suited for a church in which it is difficult to obtain good light, as it admits of large openings. The principal entrance will be from the High-street. The cost of the building will be about £4,000.—From the *Scottish Guardian*.

GORTON.—On Saturday, December 2nd, the new parish church was consecrated by the Lord Bishop of Manchester. The cost, amounting to £6,000, has been defrayed by Mr. C. F. Beyer. The church is in the Decorated style, designed by Messrs. A. and J. Radcliffe Shaw, architects, St. Chad's, Saddleworth. It consists of chancel, nave, two side aisles, vestry, and a tower, with spire.

GRAVESEND.—S. Andrew's Waterside Mission Church was consecrated on S. Andrew's Day by Bishop Claughton. The church is built on a solid wharf at the water's edge, its foundation-stone being the chalk rock under water. It is dedicated to S. Andrew, and is a memorial to Admiral Sir Francis Beaufort, K.C.B. The church is built of Kentish rag, in the Early English style of architecture, from the designs of Mr. Street, R.A. It has a bell-tower

which forms a conspicuous object to all outward and homeward bound ships, containing four musical bells. The windows will shortly be filled with stained glass; three of them are given by Lady Franklin, in memory of the petty officers, sailors, and marines of the *Erebus* and *Terror*, lost in the ice.

PRINCE'S END, TIPTON.—On Tuesday afternoon two memorial-stones of a new Baptist Chapel were laid by Mr. W. P. Greenway and Mr. M. A. Bats, M.P. The site is in Newhall-street, on the identical spot where an old chapel stood for many years. The building will accommodate 700 people, and is estimated to cost £1,200. The architects of the new building are Messrs. Weller & Proud, of Wolverhampton and Birmingham, and the builder is Mr. Haffner.

ROCHDALE.—S. John's Church, Facit, Rochdale, which was consecrated on Friday by the Bishop of Manchester, is at present only a portion of the original and complete design. The part now built comprises a chancel, 28ft. by 19ft., with north and south chancel aisles; a nave, 72ft. by 38ft.; a western porch, 25ft. by 6ft.; baptistry, 14ft. by 8ft.; and a south-west porch, which is the basement for the future steeple. The present accommodation is for 467 adults, but when completed the church will have 156 additional sittings, making a total of 623. The style is Early Decorated Gothic, the tracery and other ornamental features being of geometric forms. The cost, including between £300 and £400 for foundations, has been £3,500. The contractor for the work was Mr. W. Storrs, the foundations being put in by Messrs. Longworth & Co. The architects are Messrs. Medland & Henry Taylor, of Manchester.

RYDE, ISLE OF WIGHT.—The church of S. Michael and All Angels, Swanmore—commenced in 1860—is about to be completed by the addition of transepts and choir, with apsidal termination. Mr. R. J. Jones, of Ryde, is the architect commissioned.

BUILDINGS.

BARNSELY.—On Friday the business connected with the Barnsley County Court was removed to new premises. The building has been erected under the direction of Mr. T. C. Sorby, of London, acting as architect to the Lords Commissioners of Her Majesty's Treasury. The chief of the works have been executed by Messrs. Nicholson, of Leeds, whose contract for the erection amounted to over £7,000, or, with the land and extras, to upwards of £10,000. The building has, so to speak, two fronts—one in Regent-street and one in Eastgate.

BIRMINGHAM.—On Monday, the foundation-stone of the new wing of the Queen's Hospital—"The Working Men's Extension"—which Messrs. Horsley are building from the designs of Messrs. Martin & Chamberlain, was laid. The new building will be in the Italian style; the front will be chiefly of stone and set off by Corinthian pilasters. There will be a portico entrance with a flat roof, supported by four Corinthian columns and a pilaster at each corner of the foremost part. The centre of the frontage, of the same width as the portico, will rise above the main part about twelve feet. On the left-hand side of the lobby will be the surgeons' consulting and private rooms, and on the right the porters' living rooms. Beyond these the lobby will lead into a waiting hall, 40ft. high, 78ft. long, and 40ft. wide. The new building will be detached from the present Hospital, but there will be communication between by means of a glass conservatory, which will also serve the purpose of a promenade for convalescent patients. Connected with the new building there will also be baths and a mortuary.

MARYLEBONE NEW POLICE COURT.—A new police court is at length to be erected in Marylebone. The present court, which was originally a private house, is badly situated, and a more convenient site is to be chosen for the new building. Her Majesty's Commissioners of Works and Public Buildings, to whom the care and control of the metropolitan police courts was transferred by an Act passed in the last Session of Parliament, have at present under consideration the respective advantages of two plots of land, of which one is in Chapel-street, near the Edgware-road, and the other in the Marylebone-road, adjoining the Baker-street station of the Metropolitan Railway.

OTLEY.—The corner-stone of the new workhouse for the Wharfedale Union was laid at Otley, Yorkshire, on Thursday week. Including the site, the workhouse will cost about £11,000. It has been designed by Messrs. C. S. & A. J. Nelson, architects, of Leeds and Derby, their plans having been selected by the guardians out of those sent in by twenty competitors. The contractors for the building are Messrs. Boothman & Broomhead, of Leeds. The general plan consists of an entrance block (with offices, board-room, vagrant and probationers' wards), lying parallel with

the road; behind this block the workhouse; still further in the rear, and entirely separate, an infirmary; and to the east stabling accommodation. The front elevation is 150ft. long. Facing the south, the front elevation of the workhouse is 170ft. long. A tower rises in the centre. All the corridors are to be fireproof, on Dennett's principle. The buildings will all be of local stone, lined with brick; and the contract for the carrying out of the work has been let for the sum of £10,000.

RUSHOLME.—S. Mary's Home for Female Penitents, Rusholme, the foundation-stone of which was laid last May, was formally opened on the 30th ult. by the Bishop of Manchester. The building consists of two floors, the lower containing the day-rooms, and the upper the bedrooms. At the east end of the building is a small chapel for the use of the inmates, with a chaplain's room adjoining. The buildings are of brick, the front being finished with "white headers," with stone dressing to the main entrance and staircase gable. The roofs are covered with slates of two tints, and are finished with enriched red ridge tiles. A neat boundary wall will extend the whole length of the frontage. The total cost of the buildings and boundary walls is about £3,000, but this amount is exclusive of gifts. Mr. George Napier, City-road, was the general contractor for the work, and the whole has been carried out from the designs and under the superintendence of Mr. John Lowe, architect, S. Ann's-square, Manchester.

SALFORD.—School buildings, including residence, are about to be erected in connection with the Stowell Memorial Church, Regent road, at an outlay of about £2,000 by Mr. G. Napier, builder, Cornbrook, from the designs of Mr. J. Lowe, architect, Manchester.

WORKSOP.—Six convenient cottages have just been erected in Westgate for Mr. Geo. Mayor. They are brick built, with cast iron door and window heads by the Thorncliffe Iron Company. Mr. Sydney Tutin was the builder.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

RECEIVED.—V. & C.—S. S. S.—J. S.—J. C.—H. J. P.—Reader.—W. W.—S. G.—W. D.—J. H.—T. H.—J. E.—S. H.—E. W. P.—D. H. & J. N.—A Young Assistant. E. P.—The articles referred to were not reprinted. We do not recommend books.

T. HARRIS.—There is no such paper.

WM. JONES.—It is not intended to give reports of second course.

WRESSIL CASTLE, YORKSHIRE.—A sketch of a portion of this, with description, has been sent by some one without a name.

TOM W. WHITTEY.—Mr. Waterhouse's design for the Manchester Town Hall appeared in the BUILDING NEWS, May 8, 1868.

Correspondence.

PROPOSED COURTS OF LAW.

To the Editor of the BUILDING NEWS.

SIR,—The opinion of the profession on this work should go forth with no uncertain sound, for in proportion to its magnitude, and the expectations which have been raised thereon, the profession, before the public, is at stake as to its final issue and result. That so much time, talent, and money should have been lavished on the preparation of plans; so much precaution taken, or apparently taken, to obtain the grandest design the country can produce; and that Mr. Street was finally selected solely for his external architecture, without reference to his arrangement of the courts, have led the country and the profession to anticipate a work which, in external beauty and grandeur at least, should far exceed anything that has yet appeared. And for the reasons primarily adduced for Mr. Street's appointment, the country will demand as much. Should they be disappointed, it will be to the loss and sorrow of the present generation of architects.

Sufficient drawings of the principal front are made public to enable us to judge of its merits, before the consideration of which the high esteem in which Mr. Street is held must merge into the larger importance

of the interest and welfare of the profession at large. The public will look at it in this light: that if our best architect can conceive only an unworthy building, then, verily, those who engaged in the competition must be insignificant satellites; while those outside the circle must be in the art of architecture as the meanest stars sending forth no ray of light in the clearest firmament.

For one, I am of opinion that the architecture is not suited to a narrow street at all. To be seen properly it should have 500 yards of clear space immediately in front, but which it will never have. Only small portions of the front can be seen at once. Look at the staircase towers, that jut out in front to obstruct parallel views. What detail is there in them likely to attract attention, beyond a maze of overhanging pinnacles, crockets, and gables, and a stumpy spire overhead, struggling very hard to exhibit itself above them? As for the lower windows, the meanness of their effect is not fully apparent in elevation; there is no centre support for the outer arch moulds, which have to trust to a mitre corbel. As for the principal doorway, it is simply a copy of that to the church in Lombard-street, if I remember rightly, with the additional disadvantage that it is surmounted by a sham parapet, 60ft. behind which is a grotesque window, bigger than the end of Westminster Hall (!) in juxtaposition with which are a score of other windows not a foot wide! We say that this is architecture worthy only of a novice in the profession. To make the design passable, there should be a bold lofty range stretching from tower to tower without break, save, perhaps, a central feature rising above and out of a parapet. We have heard very much about Mr. Street's effective and picturesque detail, and truly the great western tower and quadrangle gateways are very beautiful and praiseworthy; but beside these what have we in the whole length of 500 feet frontage to justify the appellation? The best windows are nothing superior to others we have seen before; and as for those below the third story, why, they are like a schoolboy's slate, and quite as ugly. One might expect that in a crowded thoroughfare something might be accomplished worth seeing without neck-breaking; but up to a height of thirty feet—never to be neglected in a street—the windows are the most veritable holes in the wall that could possibly enter the heart of man to propose for a work of this kind.

You might think, sir, that I am writing after this manner through prejudice or a disposition to complain, but it is not so. Let me ask you to inquire of every architect in the country his opinion of these designs, and I would venture to say that ninety-nine per cent. would use language not a whit less condemnatory. The fact is, these designs have almost blighted the hopes of even the least sanguine. For the interest of the profession, we hope that these designs will not be carried into execution without considerable modifications.—I am, &c., II.

PORT NANT GRANITE.

SIR,—My attention has been directed to a statement in your publication of the 1st December (p.414), wherein Mr. Haywood, in a comparison of the number of horses falling respectively on granite and asphalt pavement within sight of No. 79, Cheapside upon certain days in 1870, mentions that, at the time when a very unfavourable average return was made, "the carriage-way was paved with Port Nant Granite, which under many years' wear had become very slippery." As such an observation is calculated to produce an impression that Port Nant Granite under many years' wear becomes more slippery than other granites, I am compelled to ask you to insert this explanation in your next impression.

The pavement in question was laid in 1861, and remained till 1870, and, for the purpose of good drainage, in a very convex form, subjecting it to the utmost disadvantage at the sides forming the two lines of traffic. In other parts of London, such as Charing-cross, the east side of the Haymarket, Long Acre, and of late very extensively in Bermondsey, Port Nant Granite, after many years' wear, as well as from the commencement, has been found and pronounced by surveyors to retain its pristine roughness, and certainly to be no more (if not less) slippery than any other kind.—I am, &c.,

W. J. DUNCUM.

Port Nant Granite Company,
4, Victoria-street, Westminster, S.W.

PLANNING HOUSES.

SIR,—The defects in house-planning are so numerous and generally known, and because of blunders which are being every day perpetuated, raising a "distrust of all architects" in the public mind so loudly pronounced, that any one oblivious to these circumstances is rather to be pitied than blamed. His observation of the times must be limited in proportion to his knowledge; while

infatuated praise—such as "Reader" has indulged in—of works which in the majority of cases have been in some way or other condemned by the public is worthy only of an enthusiast. There are some weak enough to fancy that a client possesses a kind of prophetic vision of a complete and perfected building, to perpetuate and establish which some architect is appointed to act in just such a similar manner as a mechanic does at a machine, under fixed rigid immotional rule and law, susceptible of no improvement or variation. As "Reader" appears to be one of these, he may therefore be excused the confusion he has displayed in respect of this competition being of value and interest to the profession. That he should pervert and misquote another's writing is not, however, to be atoned for. In his last letter, by taking a word from one paragraph and adding it to another of the letter he was criticising, he not only exhibits an unscrupulous method of writing, but blinds himself to the subject matter altogether. The remarks in my former letter about the houses in that place in the West of England which an American friend termed "A City of Villas" went to show that, although the entire arrangements were left in the hands of the architects, they are nevertheless in the majority of cases awkwardly and badly planned. In fact, they are mostly copies of one another manufactured by the dozen by inexperienced pupils with trifling alterations only, such as the omission of a bay window here, adding one there, &c.; but either through negligence or inability, or other causes on the part of the architects, a thorough renovation of house plans, which should be perfect and complete in all their details and ramifications, is hardly ever thought of. I apprehend, also, that the copying of old plans is very generally resorted to in the profession, not that that is an evil in itself, but the contrary, so long as the plans are the best attainable, which too frequently they are not. That "Reader" should conceive this argument proves the irresponsibility of architects for the badly-arranged houses which they build, and therefore the uselessness of attempts on the part of architects to improve our domestic architecture, is worthy only an obsolete person whose mind has faded into that of second childhood. The faults of all our badly-arranged houses, whether large or small, must rest entirely upon the architect, and not the proprietors thereof, whose wants within limits of cost he is not only bound in some measure to anticipate, but to provide for on the most perfect and advanced principles. Hence the large responsibility which rests upon every architect. It is to be regretted that "Reader" should so far misunderstand the question as to reverse that order of things by placing responsibility upon the proprietor. I am persuaded he cannot be speaking from practice, or if so, the world is not likely to be benefited by his works.—I am, &c., II.

SIR,—After having read the various suggestions as to what the conditions of the proposed "House Planning" competition should be, it seems to me that the most practical way would be to limit the cost of the building, and fix the number and proximate size of the principal rooms, leaving the area an open question, as compactness of arrangement is, I think, one of the merits of good planning. Limiting the designs to the "Gothic" or any style would not, I think, be judicious, as every competitor should have an opportunity of working in the style with which he is most familiar.—I am, &c.,

A GLASGOW STUDENT.

SIR,—Permit me to offer a few suggestions as to the conditions in the proposed "BUILDING NEWS Competition" for plans of a house. Let the appointed judges calculate beforehand the cubical contents (including cellars and all offices) of a house of the size considered sufficient, which size is not to be exceeded by the competitors. If no limit of this kind be fixed it will, of course, be impossible fairly to estimate the relative merits of plans differing largely in their dimensions.

As the object of this competition is, I apprehend, to produce convenient, well-studied plans; it seems that, instead of perspectives or elevations, a roof plan, or dotted lines on a chamber plan, should suffice. At any rate, two elevations would be all that is needed. To facilitate the labour of the judges, let each competitor give a cellar, ground, and chamber plans, on one sheet, to one-eighth scale. Indian ink only to be used. Cardinal points to be denoted. Kitchen to be on ground floor. As there will, no doubt, be many excellent plans sent in, perhaps the two coming next in merit to the prize one might receive "honourable mention," and be engraved in your journal.—I am, &c.,

G. T. J.

HOT-WATER PIPES AND WOODWORK.

SIR,—At page 378 of your issue for November 17th I observe a correspondent inquiring if woodwork in contact with hot-water pipes has ever, or can be ignited by such contact, and at page 418, December 1st, a correspondent in reply says, "Certainly if the pipes get too hot the woodwork will ignite." Now I beg to call that latter statement in question, as in all my experience I never either saw or heard of any hot-water pipes, *per se*, igniting any woodwork. Of course a hot-water pipe might be the cause, in a secondary sort of way, of setting fire to woodwork, as, *e. g.*, where the pipe is tightly boxed in, and some one working at it or being near it, when or where it is exposed, happens to get a match fall, which, dropping down between the pipe and wood, and getting jammed, is easily set fire to, either by the heat of the pipe or by the heated pipe when, being shaken by the water boiling, the pipe causes the match to ignite, and in its turn the match sets fire to the woodwork. As water

boils at 212° I should like some substantial proof and satisfactory explanation of the circumstance before believing that a hot-water pipe, *per se*, set fire to woodwork. As to the "warning-pipes" at the Crystal Palace causing a fire there—were they hot-water pipes? If not, then they have nothing whatever to do with the question at p. 371. If they were hot-water pipes, may I ask how they got "over-heated," or heated above 212°?—I am, &c., PLUMBER.

ARCHITECTS' OFFICE HOURS.

SIR,—It would, indeed, be a boon to architects' assistants to see themselves placed in the position which the cost of education, premiums, and labour given when pupils, along with other expenses, rightly deserve. It at present, however, would seem that we are to be treated more like tools than men who are as a whole equally respectable with our more fortunate employers, but who, from pecuniary or other causes, cannot commence business for ourselves. I contend that neither the hours of labour nor the remuneration are what they ought to be. A man who has no need to keep up such a respectable appearance, who can live in the smallest of houses without fear of giving offence, and who is paid from the commencement of his labour without incurring the aforesaid expenses, is now on an average receiving better remuneration than that of the architect's assistant. Is this a fair percentage for say, £250 schooling, £100 premium, and £300 to £400 in lodging, board, &c., while serving one's articles, besides the labour given free during that time? Could not an architect, receiving his 5 per cent., afford more than this, without acting too generously—to live comfortably himself, and more in accordance with that feeling of living and letting live? I fear little, however, can be done to elevate our position in any way until the grasping premium receivers are content with a less proportion of pupils. I knew of one case a little while ago where there were four pupils to one assistant, and it is generally known that pupils are at least equally numbered with assistants. With regard to the hours enough has been truly said, and I should like to see them reduced; but to do anything there must be unity, and not mere correspondence. I hope that committees will be formed in all the principal towns throughout the country, for the purpose of obtaining a signed petition to the Royal Institute and Architectural Association, to urge the desirability of improving our general position.—I am, &c.,

MANCHESTER.

SIR,—It is to be hoped that the remarks of your correspondents on this subject will call forth the sympathy of all assistants in the profession who hold similar views. The shortening of the hours of labour opens up many other questions which call loudly for reform. A proper system of education would be a step in advance, and ought to do away with a great amount of study during the hours not occupied with office work. We have long been of opinion that eight hours of mental work per day is quite enough for any one; less mental work, and more physical work would be beneficial. Many assistants, in the provinces at least, have no reduction of their daily labour on the Saturdays, and are often at work on "Competitions" after the usual office hours, for which they seldom receive any remuneration, seven or ten days' holiday in the summer being supposed to compensate for the health-destroying work during the winter. Nothing, indeed, is so injurious to health as a sedentary occupation, with too much brain work. On this ground alone we would advocate a reduction of the hours of labour, more especially during the winter months, when more exercise is required to preserve health, and (if we must study after office hours) more classes of instruction are in operation.

The question of remuneration has been noticed by one of your correspondents last week, but to discuss this fully would take up too much of your valuable journal. We would simply ask, How is it that the average salary of an assistant is not much, if anything, above that of a skilled artisan? The assistant pays to learn (?), and does work during that time besides, for which he receives no remuneration. At the termination of his articles, if he has been in a country office, he is obliged to go to London, that is if he means to make his mark in the architectural world. The London architect looks at the drawings of our country pupil, and pronounces judgment on them rather condemnatory; finally he agrees to engage him for a year, perhaps to receive no salary. He is then placed in the office, with other "improvers" like himself, under the eye of a competent principal assistant. It will be seen that talent without money is of little use, for the architectural pupil must either have sufficient to live upon during this time, or be kept by his parents or guardians. When he becomes a full-fledged assistant he is obliged to keep himself in a respectable position, live respectably, and dress respectably, that is if he has an idea to work up a connection with a view to future practice. As to marriage, he must not think of that—"it were better a millstone be tied to his neck." No; he must defer that till he is well established in practice. The artisan, on the other hand, gets paid for his work during his apprenticeship; he has generally better health; he has less anxiety about his work, and when his apprenticeship ends he is (unless his talent is considerably below the average) well paid, and his living costs much less than his brother, the architect's assistant.—I am, &c.,

York.

IIOMO.

SIR,—I can fully endorse all that "Gothic" has said in your last, our office hours being similar to his—viz., 9 till 6, winter and summer throughout, consequently we have little or no time for our work or exercise, the latter being so necessary after our sedentary occupations of the day. There can be no doubt that, were the hours shortened, more energy would be thrown into the office work, and the same amount, if not more, would be done as in the previous lengthened hours.—I am, &c., FAGGED.

THE CHORLEY TOWNHALL COMPETITION.

SIR,—I beg your insertion of the enclosed, for the benefit of competing architects, and may add that the site to be covered has a good street on every side, and must have one stone front; it embraces upwards of 1,500 square yards, and the buildings must not cost more than £10,000. I believe further comment is unnecessary. ONE THAT INTENDED TO COMPETE.

(COPY.)

At the monthly meeting, Thursday, November 30th, Mr. Derham said that many architects had applied to him, both by letter and personally, to endeavour to obtain an extension of the time for sending in plans, as it was too limited. Mr. Richmond thought it would be wise to extend the time, as they would thereby be enabled to get more talent. In reply to the chairman, the surveyor said he had sent out 227 ground plans. Mr. Taylor asked if any of the architects had said anything about the frontage. Mr. Richmond remarked that it had been left to the architects to please themselves. It was resolved to extend the time to the 30th of January next.—*Chorley Standard.*

CONTRACTS AND SCHEDULE RATES.

SIR,—I agreed to build a house conformably to a given plan, and at a certain lump sum made up by schedule rates, and bound myself to these rates or others corresponding thereto. During the progress of the building the plan was altered in various ways, causing me to lose considerable quantities of my material, it being then unsuitable, and also to lose by not having sufficient quantities of material provided for such material changes, which nearly amounted to twice the original quantities. Am I still bound to adhere to the original rate? Is the surveyor the proper party to adjust corresponding prices? Or rather is the surveyor, who is inexperienced in the difficulties and expense of procuring materials for changes on such a large scale, when such materials have to be carried two hundred miles by sea, the proper party to adjust prices? Have I no voice in their adjustment myself? If I contract to build a house of two stories, am I bound to carry it up four or any extra height at the same rate? The architect being arbiter, and in the event of his being privately in favour of the surveyor, would my case be good in point of law, were I to ignore either of their allowances? As advice will be thankfully received, if any Scotch friend replies he would much oblige by affixing the letter "S." to his signature.—I am, &c., VICTOR.

GATESHEAD SCHOOL COMPETITION.

SIR,—I was much pleased with the notes in the BUILDING NEWS for last week upon the selected designs in the above competition, by "An Architect." I should feel obliged if that gentleman would kindly publish his notes upon the rejected designs, giving the numbers, as he did last week; also the initials of the architects of each design, which I do not think would be objectionable to the competitors, but *vice versa*.—I am, &c.,

A COMPETITOR.

LAND AND BUILDING SOCIETIES.

EXETER PROVIDENT PERMANENT BENEFIT BUILDING INVESTMENT AND LOAN SOCIETY.—The twenty-second annual meeting of this society was held at the office, Bedford-circus, on Monday week. The chairman congratulated the shareholders upon the satisfactory evidence given of the progress and safety of the society. With reference to the investing shares, the numbers for 1865 were 201; 1869, 282; 1870, 331; 1871, 394, showing a satisfactory advance. The receipts from investors during the same period were £4,401, £4,461, £5,386, £6,319. Only in one year, in 1864, had that amount been exceeded. The receipts on deposits during the last year had been £12,242, the largest sum received since 1863.

LEEDS PROVINCIAL BUILDING AND INVESTMENT SOCIETY.—On Thursday week the annual meeting of this society was held. The twenty-second annual report stated that the committee were glad, as in past years, to inform the meeting that the number of members and of shares was still on the increase. The guarantee fund had increased from £83 12s. to £418 3s. 8½d. The committee again suggested, on the recommendation of the manager, that another bonus of 2s. 6d. per share should be credited to the members who had continuously held their shares for two years prior to 1st Sept., 1871. The total income of the society for the year had been £136,614 10s. 3½d. The vested shares numbered 2,932 and three-fifths, the paid-up shares 308, and the advanced shares 3,761. The stock account showed a total of £212,411 12s. 11½d., and a balance of £1,097 1s. 9d. in favour of the society.

Intercommunication.

QUESTIONS.

[2398].—**Slaking Lime.**—I wish to use concrete for some foundations. I am strongly in favour of grinding instead of slaking the lime, but, although close to the limekiln, I am some miles from any mills for grinding lime. The expense of taking the lime to any mill is out of the question. Can I do anything better than slake the lime and use it immediately? Can I in any way "pound" the lime instead of slaking, and would the quality of the concrete be sufficiently improved thereby to pay for the extra trouble? Is there any good reason for cracking the flints small when used for concrete, or is the size immaterial, provided the flints have a clean surface—supposing, of course, a sufficient quantity of clean gravel is used to fill up all interstices?—TEKTON.

[2399].—**Carrying Off Smoke Underground.**—Can any of your correspondents give me any detailed information as to the practical working of a plan for carrying off smoke underground?—J. B. WARING.

[2400].—**Close Fire Ranges.**—What is the best fuel to use for these—coal or coke; and if coke, ordinary coke or cannel coke?—R.

[2401].—**House Property.**—I should feel obliged if you or any of your readers could inform me of a good work that treats fully of the valuation of house property, including copyhold, mortgages, &c., fully explaining same, and giving the modes of calculating their different values.—R. I. W.

[2402].—**Gothic Carving.**—Will some one recommend a work illustrating carving in the Gothic and Italian styles?—JAMES MERRICK.

[2403].—**Baker's Oven.**—What is the usual mode of forming the entrance to a baker's oven; also the mode of connecting oven with flue? And what material should be used to prevent the disagreeable vapour arising from the same when placed under a street. Sketches of the two former would oblige.—R. A.

REPLIES.

[2343].—**Landscape Gardening.**—"Landscape Gardening," by A. J. Browning, and Repton's work on same subject, are both good books, and can be had at a moderate price at the second-hand book shops.—P. E. M.

[2362].—**Hand-Railing.**—"Science" will find a full elucidation of the difficulty in "Nicholson's Architectural Dictionary," under Joinery.—P. E. M.

[2364].—**Construction.**—The method suggested by "Draughtsman" himself would be the best plan to adopt, a column and two arches across transept.—P. E. M.

[2373].—**Pointed Gothic Vaulting Ribs.**—See Pugin's specimens.—P. E. M.

[2376].—**Decay of Iron Railing.**—The bottoms of iron bars when leaded into stonework rusts away from galvanic action between the two metals, assisted by wet. A remedy is to set the bars in sulphur instead of lead.—P. E. M.

[2384].—**Hot-Water Pipes and Woodwork.**—"F. L." in answering this query (which was not mine, but in which I am interested), says that "if the pipes get too hot the woodwork will ignite;" and he also asks, "Was not the fire at the Crystal Palace caused by the overheating of the warming-pipes?" But he appears to forget that there are two systems of hot-water warming—one which is known as the low pressure, or large-pipe system, which has at its highest point an open cistern; the pipes of this system cannot burst, though they may crack by reason of proper precautions not being taken to allow for expansion of the pipes. By this system the water never attains a greater heat than boiling point, which we may put at 212° Fahrenheit. Is this sufficient to ignite the woodwork? The other hot-water system is the high pressure or small-pipe system, by which water is heated under pressure to a far higher temperature—in fact, no doubt, to a degree sufficient to ignite woodwork in contact with the pipes. How was the Crystal Palace heated, by either of these systems? or was it not by hot air? Is it known whether the woodwork was in contact with the pipes; and if it was not, what was the space between?—R. Y. M.

[2386].—**Girders.**—I am happy to be able to give "Excelsior" the information he requires. For a clear span of 150ft. I should make the "bearings" of the girder, or what he terms the wall-hold, 4ft. The "wall-hold" of the girders of the Charing-cross Railway-bridge, which have a span of 154ft. in the clear, is 4ft. 6in., but this I consider in excess of the actual "hold" required. The constant adopted for girders on the cellular principle, such as the Conway and Britannia bridges, was 74°, so that the formula for the breaking weight at the centre was $W = \frac{A \times D}{L} \times 74^\circ$, in which A is the sectional area of the bottom flange, D, the depth, and L, the span. The value of A consisted in the whole of the sectional area of the plates and angle-irons which composed the bottom flange. In the case of the Britannia tube the value of A was 585 square inches, and in the case of the Conway was 535 square inches. The ratio between the top and bottom flanges was as 120:100, but the more correct ratio would have been 125:100. The difference only shows how well those old bridges were designed.—T. C.

[2394].—**School Building.**—The rules of the Committee of Council on Education were:—"In planning a school-room, if it be not more than 18ft. in width, 8 or 9 square feet will be sufficient for each child in actual attendance. If the width be greater, there must be a proportionate increase of area allotted to each child." "The walls of every school-room, ceiled at the level of the wall-plate, must be at least 12ft. high from the level of the floor to the ceiling; and if the area contains more than 360 superficial square feet, 13ft.; and if more than 600ft., then 14ft. The walls of every school-room ceiled to the rafters and collar-beam must be at least 11ft. high from floor to wall-plate, and at least 14ft. high to the ceiling across the collar-beam."—P. E. M.

WATER SUPPLY AND SANITARY MATTERS.

SALFORD.—The Salford committee has just decided to recommend the extension in that town of the "tubecloset" system. They remark—"The committee do not think the system of tubs and tubs only a perfect one, but they are of opinion that, compared with the old open midden, it has great advantages. In all future reconstructions care will be taken to so arrange the closets that a 'distributor' can be readily added if thought necessary. The committee have good reason to hope that ere long the closets in Salford will be both sightly, inodorous, and at the same time economical. Satisfied that the permeation of sewer gases into houses is a frequent source of disease, the committee have, as far as possible disconnected all scullery and bath-room drains from the sewers."

THE SEWAGE OF CHELTENHAM.—An inquiry was recently held by Mr. R. Rawlinson, C.B., the Government inspector, at Charlton Kings, upon an application of the Local Board of that district for leave to borrow a sum of £3,000 for the purpose of carrying out an independent scheme of sewage irrigation. The reply of the Local Government Board, founded upon Mr. Rawlinson's report, has been received by the Charlton Kings Board. The Local Government Board say that they have carefully considered Mr. Rawlinson's report, and it appears to the board to be so desirable that there should be a joint system of sewage for the two districts of Charlton Kings and Cheltenham, instead of adopting the scheme for which the proposed loan is required by the Local Board, that under existing circumstances the Board would not be justified in authorising the Local Board to borrow the amount in question, and the Local Government Board strongly recommend the Local Board to endeavour to come to an arrangement with the Cheltenham Commissioners for the sewage of the district through the Cheltenham outfall.

Our Office Table.

A RELIC OF ALBERT DÜRER.—An artistic curiosity of great value has lately come to light in Vienna. It is a complete set of wooden chessmen, some inches high, richly carved, and full of character, by no less a master than Albrecht Dürer. The work is in perfect preservation, and its genuineness (according to the *Augsburg Gazette*) can scarcely be doubted, as it has been for centuries in the possession of the same family, which, though of late resident in Austria, came originally from Nuremberg, and possessed besides this work a large oil portrait by Lucas Kranach, of a city notable, their relation. The last owner only leaves a daughter, and it is believed this interesting heirloom will soon become public property.

S. BARTHOLOMEW'S HOSPITAL SURVEYORSHIP.—The candidates for this office attended before a committee of the governors on the 5th inst., when three gentlemen were returned to be presented to the general body of governors, with whom the election rests. Mr. T'Anson, Mr. E. N. Clifton, and Mr. Frederick Marrable were the selected candidates. The election takes place on the 18th inst.

DEATH OF THE VERY REV. CANON ROCK.—We have to report the decease of the Very Rev. Daniel Rock, D.D. one of the canons of the titular Chapter of the Cathedral of Southwark. Born in the year 1799, he was a native of Liverpool; he received his early education at the College of St. Edmund, at Old Hall, near Ware, in Hertfordshire, and completed his divinity course at the English College at Rome. In 1852, soon after the establishment of the Roman Catholic hierarchy, he was nominated one of the first members of the new Cathedral Chapter of Southwark; and two years later his love of books led him to give up his country charge. He was the author of a large number of publications. In 1862, Dr. Rock, as a member of the committee, took a very active part in carrying out the objects of the special loan exhibition of Mediæval works of art at the South Kensington Museum, and he contributed to the official catalogue an article illustrative of the ecclesiastical

vestments, embroideries, &c. there exhibited. For the last few years of his life he resided at Kensington, and his council and advice were often sought, and never sought in vain, by the authorities of the South Kensington Museum and the managers of art exhibitions.

FALL OF A HOUSE IN GLASGOW.—On the morning of the 23rd ult., a large four-story tenement situated in Old-wynd, a narrow land or alley, fell in with a terrible crash. The building was occupied by about fifty persons, all of whom with one exception—a man who from the more precipitate manner of his escape got his leg severely bruised—were enabled to leave without injury. This was owing to the heroism of the night constable on duty, who, at the risk of his life, and almost as the building was falling, ran up stairs and warned the inmates of their danger. The poor people had left to them little beyond their lives. A subscription is afoot from which to reward the constable for his bravery.

THE IRONMONGERS' COMPANY.—The surveyorship to this company is now vacant, the surveyor who had held the office for many years having lately resigned. There are several candidates—among others Mr. Richard Roberts and Mr. Stoek. The salary is one hundred guineas a year, and although no commission is payable with respect to new buildings, it has been usual to give the surveyor an honorarium equivalent to the usual commission on the occasion of the erection of any new buildings by the company. The property belonging to the company in London is not of any great importance, but they have an extensive estate in Ireland, consisting chiefly of farming land. The election of the surveyor will take place at a special court to be held this day (Friday).

VALUE OF LAND IN WALWORTH.—The fifteenth portion of the Walworth Common Estate was submitted to public competition at the Elephant and Castle Tavern, Newington, recently, by Messrs. C. Stuart Barker & Son, the auctioneers. After spirited biddings the whole of the lots were let at extraordinary ground rents. The land comprised sites for 66 private houses, 6 shops, and a corner tavern (as a matter of course), and the whole realised, according to the *South London Press*, £638 10s. per annum. The tavern plot, situated at the corner of Villa-street and the new Westmoreland-road, with a frontage of 23ft. and a depth of 75ft., was knocked down at the sum (unprecedented in the locality) of £230 per annum, the highest bidder taking the risk of obtaining a transfer of the license from an older house. The total amount realised for the seventy-three plots was at the rate of £348 per acre per annum, and this, capitalised at 22½ years' purchase, gives in round figures £8,000 per acre as the value of the freehold. When the leases which have just expired were granted in 1773, this same land was let at less than £4 per acre per annum, and this, capitalised in the same way, would give £90 per acre as the value of the freehold at that time. This is an increase of nearly a hundred-fold.

ROUGH EXAMINATION OF WATER.—In reply to an inquiry in a recent number of the *British Medical Journal* for an inexpensive mode of analysing water for organic impurities, Mr. G. F. Hodgson recommends the following:—Half-fill a good-sized decanter (previously quite clean) with the suspected water, cover its mouth, shake well, and then apply the nose. If nothing unpleasant is detected, close the bottle tightly, and set it aside in a warm place—98 or 100 deg.—for two or three days, and then repeat the shaking, &c., as at first. If this time no foul odour is detected, the water is not of very bad quality. Smaller amounts of organic matter, and the exact character of other constituents of water, can only be determined by chemical analysis.

MEETINGS FOR THE ENSUING WEEK.

TUESDAY.—**INSTITUTION OF CIVIL ENGINEERS.**—(1) Discussion on Mr. Bell's paper "On the Stresses of Rigid Arches and other Curved Structures." (2) "On the Somerset Dock, Malta." By Mr. Charles Andrews, M. Inst. C. E. 8 p.m.

WEDNESDAY.—**SOCIETY OF ARTS.**—"Observations on the Esparto Plant." By Robert Johnston, Esq. 8 p.m.

ARCHITECTURAL ASSOCIATION.—Meeting of Class for the Study of M. Viollet le Duc's works. 6.30 p.m.—Meeting of Elementary Class of Design; subject: "Full-size Arch Mouldings, Caps, Bases, and other Details." 8 p.m.

FRIDAY.—**ARCHITECTURAL ASSOCIATION.**—"On the Mediæval Architecture of North and Central Italy." By Mr. H. L. Florence, A.R.I.B.A. 7.30 p.m.

CHIPS.

The new Congregational Church, Isle of Wight, is to have two painted windows by Lavers, Barrand, & Westlake. A bell has been offered, but is still a moot question with the committee.

The new station at the pier gates at Ryde, Isle of Wight, also the tramways, slipways, &c., are being rapidly pushed forward towards completion.

A peal of eight bells, which has been presented by Mr. George Hegginbottom, and has cost nearly £900, was on Saturday afternoon, the 2nd inst., lodged in S. Peter's Church, Ashton-under-Lyne. The weight of the peal is over four tons.

The Bishop of Winchester has accepted the post of President of the Annual Meeting of the Archaeological Institute, to be held in Southampton in the course of next summer.

The parish church, Kingston, I.W., of considerable antiquity, and one of the smallest in the island, has undergone restoration under the guidance of Mr. R. J. Jones. The parish church, Chale, is under process of restoration under the same hands.

Timber Trade Review.

PRICES, December 4.—Deals, &c., per Petersburg standard hundred: Quebec first floated yellow pine, £16 15s. to £18; ditto seconds, £12 10s. to £13; ditto thirds, £8 10s. to £9 5s.; first quality bright, £18 to £20; ditto seconds, £13 10s. to £13 15s.; ditto thirds, £8 15s. to £9 10s.; Archangel yellow, £12 15s. to £14 15s.; ditto seconds, £9 10s. to £10 5s.; Petersburg yellow, £13 10s. to £14; Wyburg yellow, £10 to £10 15s.; Petersburg and Riga white, £8 10s. to £9 10s.; Christiana deals (yellow and white), £10 to £12 15s.

PRICES OF TIMBER AT HULL.

TIMBER.—Memel, best red.....	£4 0 0	to	£0 0 0
" Dantzie, best red.....	4 0 0	"	0 0 0
" Memel and Dantzie			
seconds.....	2 17 6	"	3 0 0
" Quebec red pine.....	3 15 0	"	4 0 0
" Swedish timber.....	2 12 6	"	2 17 6
" S. John's yellow pine.....	4 10 0	"	0 0 0
" Quebec yellow.....	4 10 0	"	0 0 0
" Quebec oak (per foot).....	0 2 3	"	0 0 0
" Quebec elm.....	0 2 3	"	0 2 6
" Memel logs.....	0 6 0	"	0 6 0
DEALS.—Onega.....	15 5 0	"	15 15 0
" Petersburg red (best),			
per standard 100.....	14 0 0	"	14 5 0
" Riga white.....	8 0 0	"	8 5 0
" Gelfe (best), 3-11.....	12 15 0	"	0 0 0
" Gelfe 3-9.....	12 5 0	"	0 0 0
" Wyburg red.....	11 0 0	"	11 5 0
" Gothenburg red.....	9 5 0	"	0 0 0
" Memel seconds (red			
wood).....	10 5 0	"	0 0 0
" Quebec first yellow pine	19 15 0	"	0 0 0
" Quebec second yellow			
pine.....	14 5 0	"	0 0 0
" Richibucto best pine.....	15 5 0	"	0 0 0
" Richibucto seconds.....	10 5 0	"	0 0 0
" S. John's spruce.....	8 5 0	"	0 0 0
STAVES.—Memel crown.....	18 0 0	"	19 0 0

Trade News.

WAGES MOVEMENT.

SHEFFIELD.—The Sheffield carpenters and joiners have invited the masters to co-operate with them in the formation of a Board of Arbitration, to be composed of eight employers and eight masters; all matters in dispute to be referred to the board, the voting powers of each side being equal on all occasions.

SUNDERLAND.—The strike of the Sunderland house joiners has terminated, the men having accepted an offer of fifty-three hours and 30s. per week, instead of fifty hours and 28s. per week. Work was resumed on Monday morning.

DUNDEE.—A meeting was held by the cabinetmakers, upholsterers, and polishers in Dundee, on Saturday evening, when it was resolved to intimate to their masters that they were to adopt the nine hours' movement on January 1, without any reduction of wages.

TENDERS.

HAMPSTEAD.—For the erection of Wesleyan Chapel Mr. Charles Bell, architect. Quantities supplied by Messrs H. Lovegrove & W. H. Barber:—

Wicks, Bangs, & Co.....	£4875
Patman & Fotheringham.....	4787
Dove Brothers.....	4545
Hobson.....	4455
Stevenson.....	4208
Hibbins & Trasler.....	4196
Chesham.....	4150
Henshaw.....	4084
Scrivenor & White.....	4048
Nutt & Co.....	3950

(The latter accepted, subject to certain modifications.)

LINCOLNSHIRE.—For the erection of new Public Schools, Boston. Mr. Wheeler, architect:—

Chappell.....	£1430
Plowman.....	1285
Hobson & Taylor.....	1272
Huddleston.....	1197
Pannell & Co.....	1195
Shervin (accepted).....	1194

LINCOLNSHIRE.—For the erection of additional buildings to Workhouse, Boston. Mr. Kirk, architect:—

Broadhurst.....	£2915
Stevenson & Co.....	2510
Hobson & Taylor.....	2478
Moore.....	2300
Rudd.....	2124
Dawson.....	2130
Huddleston.....	2097
Chappell (accepted).....	1772

NORFOLK.—For additions and alterations to "The Dove" public-house, Poringland, Norfolk, for Messrs Steward, Patteson, & Co., brewers, Norwich. Mr. James S. Benest, architect:—

Browne & Bailey (accepted)..... £177 10 0

NORFOLK.—For alterations to "The King's Head" public-house, Hoveton, Norfolk, for Messrs Steward, Patteson, & Co. Mr. James S. Benest, architect:—

Browne & Bailey.....	£502 0 0
Downing.....	495 0 0
Colman.....	494 10 0
Wright.....	488 0 0
Taylor (accepted).....	475 10 0

NORWICH.—For new bar to the "Horse Barracks" public-house, Norwich, for Messrs Steward, Patteson, & Co., brewers, Norwich. Mr. James S. Benest, architect:—

Downing.....	£172 12 0
Colman.....	167 6 0
Taylor.....	157 10 0
Wright.....	154 18 0
Browne & Bailey (accepted).....	143 8 0

PORTSEA.—For work at Royal Portsmouth, Portsea, and Gosport Hospital. Mr. G. Rake, architect:—

Barnes & Moody.....	£296 0 0
Smith.....	293 10 0
Ward.....	290 0 0
Larcombe.....	270 10 0
White & Son.....	260 0 0
Light & Roberts.....	259 0 0
Copper.....	237 0 0
King.....	247 10 0
Barbridge (accepted).....	215 15 0

PONDER'S-END.—For the erection of Teachers' Residence and School, S. James, Ponder's-End. Messrs. Paul & Robinson, architects:—

	Residence.	School.	Total.
Dove Bros. £775 0 0	£855 0 0	£1630 0 0	
Child.....	580 0 0	900 0 0	1480 0 0
Linzell.....	500 0 0	870 0 0	1370 0 0
Peto Ward.....	495 0 0	824 0 0	1319 0 0
Field & Sons.....	538 0 0	718 7 6	1256 7 6

UPPER HOLLOWAY.—For the erection of two cottages in Pine-Apple Grove, Tollington Park, Upper Holloway, for Mr. Staunm. J. C. Turner, Esq., architect:—

Toms.....	£580
Hawke.....	550
Driver.....	543
Gregory (accepted).....	532

Ashton & Green, Slate and Slab Merchants and Quarry Agents.—Shippers, Merchants, and Contractors furnished with Price Lists of every description of ROOFING and MANUFACTURED SLATE, Railway-rates, &c. Agents for London and Country for the Sale of the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices of A. & G.'s RED RIDGE TILES, specially prepared for use with these Slates, on application.—Offices and Show-rooms, 14 & 15, Bury-street, St. Mary Axe, London, E.C.—[ADVT.]

CONTRACTS OPEN FOR BUILDING ESTIMATES.

WHITEHAVEN, December 30.—For the construction of a wet dock and a short railway connected therewith. John Collins, Secretary, Town Hall, Whitehaven.

WINCHESTER, December 20.—For pulling down and rebuilding the house and shop, No. 32, High-street. Thomas Stophor, jun., Architect and Surveyor, No. 57, High-street, Winchester.

SALFORD, December 14.—For the sewerage, draining, and completing of certain courts and passages in the Salford district. Edwin Andrew, Town Clerk, Town Hall, Salford.

START LIGHTHOUSE, December 18.—For the construction of an additional dwelling, making alterations and additions to the tower, together with other works, at the Start Lighthouse, near Kingsbridge, Devon. Mr. Robin Allen, Trinity House, London, E.C.

LEEDS, December 15.—For the erection of a Methodist New Connection chapel, Ventnor-street, Kirkstall-road. Hill & Swann, Architects, Leeds and Sheffield.

HUDDERSFIELD, December 18.—For altering and enlarging the national schools, at Honley, near Huddersfield. Ben. Stocks, Architect, Bankfield-road, Huddersfield.

HUDDERSFIELD INFIRMARY, December 28.—For additions and alterations to the infirmary. John Kirk & Sons, Architects, Huddersfield and Dewsbury.

BILLERICAY, December 26.—For paving the foot-paths on either side of the town of Billericay with 2½ in. tooled York paving.—Charles C. Lewis, Clerk to the Billericay Highway Board, Brentwood.

BEVERLEY, December 21.—For the erection of three thirteen-roomed villas on land adjoining the New-walk.—Mr. William Haw, North Bar-street, Beverley.

STRASBOURG, January 31, 1872.—For the erection of a Christian Protestant church at Strasbourg, to replace that destroyed during the late war.—President of the Consistory.

ABERDARE, January 4, 1872.—For the construction of a reservoir, with masonry and other works.—Mr. H. J. Collier, Clerk to the Board, Aberdare.

HALIFAX, December 14.—For the completion of the Halifax and Ovensend Railway, about 2½ miles long.—Samuel Utley, Secretary, James-buildings, Halifax.

THE BUILDING NEWS.

LONDON, FRIDAY, DEC. 15, 1871.

HOUSE DRAINAGE.

MORE attention has, naturally, been called to the question of house drainage by the serious illness of the Prince of Wales than it has received in consequence of the illness, caused by its defects, of thousands of others. It seems to be the general opinion of the medical profession that the typhoid fever which has seized upon the Prince is the result of the inhalation of sewer gas. The fever itself was not apparent for some days after the Prince had left the house at Scarborough at which he had been staying on a visit, and in or about which he caught the germs of the disease. In the drainage of Londesborough Lodge, at Scarborough, there has been no want of attention such as is given to this subject by the persons usually employed to execute works of house-drainage, but there is a lamentable want of appreciation by most of these of the importance of the thing, and of the natural results of it. The chief thing that they seem to think desirable is to have the drains large enough and to give them plenty of fall. This being secured, they rest satisfied that they have drained the house, and if afterwards the doctor requests that the drains be examined, on being called in to cure persons of diarrhoea or of typhoid fever, they think they come out of the question with clean hands when they are able to report that they have examined the drains and that there is no deposit in them. They did so in this case, but it is only one of a thousand of exactly similar import. In connection with this very serious case of the illness of the Prince of Wales it is worth while to quote the report made on this subject in reply to the demand of the owner of the house that the drains be immediately examined. The architect, the clerk of the works, and the contractor make a joint report in which they say, "We have carefully examined the drains and cesspools both inside and outside the building, having had them opened for the purpose. We find that the drains from the several water-closets and sinks are in perfect condition; the fall to the main sewer is very great, and the drain-pipes from the closets and sinks are perfectly free from matter; in fact, from the nature of their construction, no deposit of any sort can remain in them. The effluvium traps in connection are all that can be desired, and we are of opinion that no offensive smell can pass through them. We have also examined the drains outside, taking surface water and water from roofs, and find they are not connected with any water-closet drains. As they are properly trapped before entering sewer drains, no foul gases could be generated in them. We have also examined the sinks, &c., in the culinary department, and find that the sanitary arrangements are as complete as possible."

We refrain from giving their names, because that would certainly do them an injury; and as we are convinced that it has been only from ignorance that they could have spoken of this drainage in such terms, a little reflection on their part will, we have no doubt, soon convince them of the truth, and prevent them again executing house drainage in the manner in which this work at Londesborough Lodge has been done.

The whole of Scarborough is drained into the sea, the outfall sewer running along the beach for a distance of 2,000ft. to a spot that has been considered a proper one at which to empty the sewage into the sea. This length is necessarily flat, and the water rises above the sewer at every tide. From the point that may be called the commencement of the outfall sewer the sewers and their branches begin to rise rapidly towards

the town. Londesborough Lodge stands 130ft. above the sea, and the branch sewer into which it is drained has a great inclination. Other sewers at Scarborough are similarly situated. The drain from the house in question is a 9in. pipe, receiving, before it leaves the premises, from water-closets and sinks, in all thirteen inlets. Every inlet is trapped, of course, as stated. What is a trap? Common house traps are so constructed as, when in perfect order, to oppose the obstruction of a column of water about 2in. in height to the effort of the elastic gases within the drain to escape at these openings into the house. In rare cases, where extra expense is not required to be considered, the depth of water, or, practically, the height of the column of water, is 3in. Usually, however, the trap consists of about 2in. of water, and in many cases even less than that.

Now, the error made by builders in the drainage of houses is the forgetfulness that the sewage begins immediately after its entry into the drain to give off gases. Its composition begins to be resolved into its elements, and gases of very small specific gravity are liberated, as well as others of greater specific gravity, the liquid and solid portion of the sewage continuing all the time to roll away towards the outfall, the lowest point of the drain; but what becomes of these light gases that are liberated, sulphuretted hydrogen being one of the most deadly? They ascend naturally to the highest points of the drain, and these highest points are those at which the traps are placed—at, in fact, the soil pans of water closets and the sinks of kitchens and sculleries. Now let it be considered that two bodies cannot occupy the same space at the same time. Supposing all these traps to be perfect in construction and always charged with water, the action is this, that when water is poured down a sink or a water closet or from any other source, a volume of air—which in this case is loaded with sewer gases—must be displaced equal in volume to the quantity of water delivered into the drain. The quantity of water daily delivered into house drains is about 5 cubic feet for every individual inhabitant. In the night time very little sewage flows down the drains, the drain being then chiefly occupied by air more or less loaded with the gases derived from the decomposition of the sewage. As soon as people become active of a morning, and begin to deliver water into the drains, the gases within them—always supposing the most favourable circumstances of the traps being perfect—become displaced by the more powerful action of the liquid, and, again supposing the traps to be perfect, they become compressed; but it is a law of Nature that all elastic bodies, such as these gases, react with a force equal to that by which they have been compressed. The cubical capacity of the drains and sewers is constant, but the quantity of sewage flowing down them varies from hour to hour of the day. The variation is so great that it is found that one half of the whole quantity of sewage due to the twenty-four hours runs off in from six to eight hours, and that at certain times as much as three times the average hourly flow takes place. These fluctuations in the quantities of sewage cause constant compression and expansion of the gases in the drains. Now water does not afford a complete block to the passage of sewer gases; it quickly absorbs them, and when the water has become saturated with them a slight increase of elastic force on one side of a trap is sufficient to disturb the equilibrium, and cause the gases to rise into the house on the other side. This action takes place when the traps are in their most perfect condition; when imperfect, it is needless to point out how readily sewer gas passes through them. Now, when these things are considered, it becomes a matter of the merest common-sense to provide means of escape for these gases that are constantly being displaced to some place where their escape will be harmless, or of the least possible

harm; and this is accomplished in the most direct and effectual way by carrying up at the head of every branch drain a special ventilating pipe, and terminating it with an open end some few feet above the highest part of the roof of the house, taking care at the same time that its termination shall not be in close proximity to a bed-room window.

Now let us compare with these principles the practice at Londesborough Lodge. All the openings to the drains were trapped, but no means of escape whatever were provided for the sewer gases. The consequence was that they forced themselves through into the house. One of the cisterns from which the water-closets were supplied was within the roof and the other on the roof of another part of the building. The soil pipe from the closet on the ground floor was carried upwards to receive another from a closet on the first floor; it was again carried upwards, and if it had been carried upwards as a ventilating pipe, terminating with an open end above the roof, it is more than probable that there would have been no typhoid or other fever in the house, but instead of that simple and effectual mode of relieving the pent-up gases in the drain, this soil pipe was carried up to and through the cistern, and served as a waste pipe to it; but as in the opinion of those who laid the drains everything must of course be trapped this pipe was trapped below the water level of the cistern so as to prevent the escape of foul air by that means into the house roof. A more effectual way of driving it into the lower stories of the house could not have been devised. Could it have been a miserable economy that suggested the saving of a separate waste pipe by making use of the soil pipe? It could hardly have been so in this case; the more probable cause was complete ignorance of the effects of what was being done. The only alternative to this imputation would be a charge of criminal negligence. And yet it is curious that somebody should not have been struck with the idea of the necessity of ventilation of the drain, for after it had been laid, and a candle taken down to the end of it, the candle was blown out by the draught up the drain—no doubt the tide was coming in at this time, and the remark that the workman whose candle was blown out made upon the occurrence was that it (the draught) would have blown a dozen out.

Truly, there was what the doctors call a sigmoid bend, but what we call a syphon trap, placed upon this drain to prevent the return of air into the house, but we see by the candle experiment how ineffectual that was, and the probable reason of its inefficiency is, that the violent movements of the air in the drain below the trap displaced the water in the first instance, and that the regurgitation which followed emptied the bend to a sufficient extent to allow a free passage of air up the drain and over the surface of the water left in the bottom.

The drain from Londesborough Lodge has no separate outfall of its own, but, like other drains, is connected with the main sewers of the town. It is therefore affected by the fluctuation of the sewage in the main sewers as well as by that within itself.

Everything, both in this case and in numerous others that have come within our notice, shows that house drains must be provided with means of escape for the gases that are continually being formed in them by the decomposition of the sewage, and that traps, without free exits for the gases, are mere delusions. When such exit pipes are provided, however, then traps become useful in preventing the escape of the gases at other points than those provided for them.

It is necessary to observe that ventilating pipes should be specially applied, and that the rain-water pipes should not be used for this purpose. The same kind of piping does very well, that is the common cast iron rain-water piping of 3in. or 3½in. diameter. Whenever a ventilating pipe can be carried up at the

back of an external fire-flue that is the best of all places for it. The two chief reasons why the rain-water pipes should not be used as ventilating pipes are that they often terminate too near bedroom windows, and that when most required to act as ventilators, that is on a sudden influx of water to the drains, their throats are choked by the water itself.

ARCHITECTURAL WORKS IN THE KENSINGTON LIBRARY.

THE value of the Art Library at Kensington is becoming pretty generally known to architectural students; but we are not sure that those who resort there are always as well acquainted with its contents as they might be. There seems for the most part to be a run on some twenty or thirty books, while the great bulk of the volumes stand on the shelves neglected. Of these books, some, like M. V. le Duc's "Dictionary," are almost indispensable, and it is a matter for rejoicing rather than regret to see so many young men making themselves familiar with them. Others, like Owen Jones's "Grammar of Ornament," seem to be used for little else than "cribbing," and sustain such continued wear and tear from a particular class, that we may expect them very soon to vanish from their place. With the cribbers we have nothing to do. Far be it from us to direct them to new spoils, and encourage them to seize on yet unprofaned treasures. But to the genuine student we may volunteer some information which may probably be useful to him. For a particular purpose we read through, a year or two since, the whole of the catalogue, in some fifteen or twenty folio volumes, as it then existed. We made at the time an abstract of the principal books on certain architectural subjects, and took the further trouble of examining them and recording our impressions of their value. As in all large libraries, there is a vast amount of trash, or at least of publications valueless for ordinary study. For historical purposes they may be highly valuable; as aids to art-education it is a waste of time to consult them. The architectural books, too, are in a minority. Provision is made for other artists besides those of our profession, and made, to all appearance, with greater liberality. Still, though one's patience is sometimes tried by washing a ton of sand for a grain of gold, there is a pretty fair average return for the labour, and there are at times to be found some very considerable nuggets, a short account of which we may lay before our readers. The most convenient way will perhaps be to arrange them according to the styles and countries with which they deal; though many works will, on this principle, need to be included in more than one department. To simplify matters, we shall class Romanesque in all cases under the head of Gothic. Our notes, we ought to state, were not made originally for publication. We do not, therefore, profess to give titles with exactness; our list may be relied on for the subject and the author's name, and the book may readily be identified by referring to the latter in the Library Catalogue.

1. FRENCH GOTHIC.—Having already mentioned M. V. le Duc, we may next draw attention to the splendid monographs of Chartres and of Bourges Cathedrals, by M. Lassus. Besides the general drawings, they comprise a magnificent series of details, giving the sculpture of the great portals especially in a style which no draughtsmen but French ones seem capable of arriving at. We would point out how perfectly the modelling of the figures is rendered without the least blackness or exaggeration in the shadows; while the illustrations of foliage and stained glass are as good substitutes as any illustrations can be for the originals themselves. Chapuy and Ramée's "Moyen Age Monumentale" is not fit to be named after

the last as regards accuracy and perfection of work; but it contains effective views of many French cathedrals. There are five quarto volumes of it, three of which are devoted principally to France. Revault's "Romanesque Architecture of the South of France" is worth studying. It contains well-drawn plans and sections of some very interesting churches, of a much more refined type than our English Norman ones; it exhibits that singular return to almost pure Classic mouldings which took place in this district about the end of the eleventh century, and it has here and there, too, some conventional ornament which would not disgrace the fully-developed Gothic. Gailhabaud's "Architecture," in five volumes, contains many fine pieces of detail. Rheims Cathedral, with its admirable buttresses and canopies, occupies a good deal of space, though not in the slightest degree more than it deserves. Amongst the other contents is a miscellaneous but valuable series of doors, of wood, bronze, and iron, the latter being from Rouen. Calliat's "Encyclopædia," in nearly a score of volumes, contains many good plates. The subjects are of all styles and ages, but many must be included under our present head. Amongst them, as in the last work, there are some noticeable wooden doors and iron gates, also good specimens of dormers, stone staircases, carved stalls, door knockers, and wooden ceilings. In connection with dormers we must not here forget Clinton's "Domestic Architecture," and Verdier and Cattois' "Architecture Civile et Domestique." The latter has some excellent examples of windows, fireplaces, and ornamental wood and iron work, not to speak of the general elevations, which deserve study. The "Archives de la Commission de Monuments Historiques," published by the Imperial Government, is not unworthy of a national undertaking. For clearness and accuracy of drawing, apart from the value, which in many instances is very great, of the buildings it illustrates, this work merits the careful examination of all architectural draughtsmen. Amongst the rest it contains a complete set of plans of S. Seruin, Toulouse, and much work also of the late Flamboyant or Burgundian period. A fine series of views, partly of portals and partly of entire cathedral fronts, may be discovered by referring to the catalogue of photographs. Those from Amiens and Notre Dame, Paris, are particularly good. Johnson's "Early French Architecture" is doubtless too well known to need our recommendation; and so, perhaps, is King's "Study Book." The latter is excellent as a parallel of general plans and arrangements; it includes a vast number of churches, and its value only becomes fully evident by careful investigation. Like Mr. Johnson's, this is far from being a showy book. There are no perspectives, except a few small outline sketches; there is little shading, and the details are drawn in a hard and wiry manner, which by no means does them justice. To any one who wants an idea of the actual effect and appearance of the churches included, this is the last work we could recommend; but to those who know the effect, and want to refresh their memories about the way in which it is produced, these skeleton plates may be very serviceable. For carved foliage, there are few books better, as far as it goes, than Adam's "Gothic Sculpture." The shading will not compare, for exaggerated force, with that in Lassus' "Monograph of Chartres," but it is still quite up to the average of what we are used to in England. Amongst minor works on French Gothic we may mention those of De Caumont, Cochet, Mandet, and Martin. Those to whom it is still unknown will find Lenoir's "Architecture Monastique" worth making an acquaintance with. M. de Verneilh we must mention by himself, as the author of a deeply interesting work on "Byzantine Architecture in France." Mr. Burges' drawings were not published when our list was made; and though we are sure they ought to be, we are

not sure whether they are, in the Library at present.

GERMAN GOTHIC.—Förster's "Monuments of Germany" is the most important work to be noticed here. In addition to the text, it comprises nearly twenty volumes of plates, fairly executed, though by no means comparable to French ones. It is generally as easy, we may remark, to distinguish the drawing of the chief European countries as their architecture; and there are peculiarities about German drawing that make it quite unmistakable. The inferior specimens have an uncouth clumsiness of outline, and an indescribable heaviness of shading which is found hardly anywhere else; the more careful drawings, such as those of Förster, may be mechanically correct, but there is an iron rigidity about them which is neither pleasing nor natural. Boisserée's "Churches of the Lower Rhine," though forty or fifty years old, will still repay examination. As in all books of that period, except Classic ones, the details cannot be depended upon; but it is the arrangement, as shown in the plans and sections of these Rhenish churches, which possess special interest. For views of them as they are, we can refer to nothing better than the admirable photographs in Mr. Seddon's "Rambles Through the Rhine Provinces," which only needed some woodcuts of plans and sections to make it supersede Boisserée altogether. Lubke's works, under various titles, also illustrate, on a small scale, many German churches, and many more may be found in King's "Study Book," before named. Hubsch's "Early Christian Architecture" gives others, not later than the Romanesque period; and the Library possesses many photographs of German work, which may be obtained from the Photograph Catalogue. Rickert, in his "Remarkable Buildings in the History of Art," illustrates, by no means well, Notre Dame, Trèves, and some others. Adler is the author of a work on "Mediæval Brickwork in Prussia;" Essenwein has a book on the same subject in Germany at large, and Kallenbach treats of ancient German architecture generally. None of these three books are put down in our memoranda as of much interest. Kugler has a good handbook of architecture, to which an atlas of plates is appended; and though they are small in scale, they are worth looking through. Lind's "Ecclesiastical Monuments of the Austrian Empire" is a noticeable work, containing plans and views of many small but curious churches. Mithoff has published a book on "The Churches of Hanover," and another on "Mediæval Remains of Lower Saxony;" and Quast's work on "Prussian Architecture" shows some old brick churches. Schimmel's "Architecture in Westphalia," and a multitude of other German books which we might enumerate, are not worth, as regards art study, the trouble of asking for them. Fergusson's "History of Architecture" may furnish some examples not found in the above list; but the general impression left by the books under this head is that German art never rose very high, and that in modern times it has sunk exceedingly low. We may refer to Italian and Spanish art literature, as well as to that of Egypt and Eastern Christendom, in another article.

NOTES ON BRICKWORK.—V.

WHETHER a wall be intended to carry weight or merely to resist the horizontal pressure of wind, as in a garden wall, or of earth, as in a retaining wall, it is always advisable to spread the base of the brickwork over as large an area as the strength of the bricks will allow; but this strength is often exceeded; thus it is often seen that single courses of bricks are laid over a large area and gathered-in a quarter of a brick on each side at every single course, as in Fig. 2, but this is more than bricks of ordinary quality will bear when the weight is considerable,

or than the strongest bricks, put together with ordinary mortar joints, will bear, and the result is that when the weight is great they are broken off.

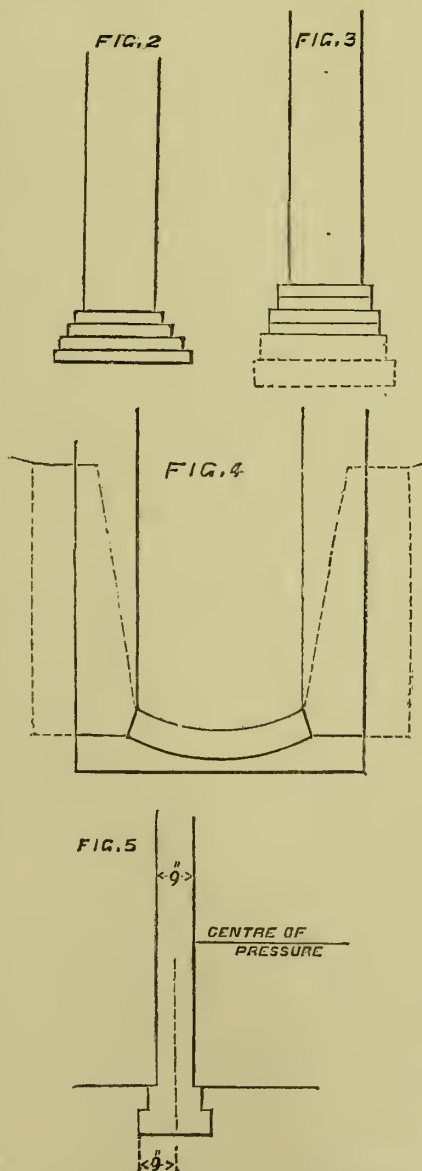
The better way is to gather in the courses a quarter of a brick at every two courses in height, as in Fig. 3. It cannot be done without cutting closers here and there, but better than single courses and weak footings. In this way the footings have four times the strength to resist the tendency of the weight to break them off that the single-course footings have; and whereas it is useless to spread the footings over so large a base that the transverse strength of the bricks or of the mortar joints is not equal to the duty of transmitting the weight uniformly over such a base, it is better to increase the number of double courses until that width of base be obtained, as in the dotted lines of Fig. 3; but the very least that should ever be done in this matter, even for the commonest walling, is to lay the first two courses double, even if the succeeding ones be single. In all single courses the outside bricks should be headers, in order to gain as much bond as possible.

A great error is sometimes made by turning inverted arches across openings to carry weight, instead of relying upon a direct foundation. They are often made very flat; if they were semicircular there would be less objection to them, but with an invert such as that shown in Fig. 4 the effect of the weight is to throw a horizontal pressure on the backing that it is sometimes not able to stand against, and any lateral movement throws the wall out of plumb, and thereby takes away the support from under the weight. This is especially the case when the weight with which the invert is loaded is not equal on each side of the arch.

But inverts are very useful in situations such as those shown by the dotted lines in Fig. 4, which represent not weight-carrying walls, but retaining walls well backed up. In such a case an invert transfers the horizontal pressure of earth from either side to the other. An invert, however, may often be advantageously employed to carry weight and spread it over a larger area of a weak foundation, if the precaution be taken to give sufficient abutments to it, the resistance of which should be equal on both sides. The existence of unbalanced forces in any structure whatever is a clear proof of bad design.

When bricks are laid with their length across the wall they are headers; when lengthwise with the wall, stretchers. Bricks must always break joint, half a brick in general, but never less than a quarter-brick, in order to bond the work together. The old English bond consists of alternate courses of headers and stretchers. This method of building a wall gives it twice the power to resist the tendency of the weight to split it lengthwise that it gives to it to prevent a vertical crack crosswise, and if we disregard bond and inquire which of these two kinds of fracture a weight has the greater power to produce, we find that, supposing the foundation to be equally firm throughout the length of the wall, it has the greater power to split the wall, because the line of least resistance lies crosswise, and it also has the additional tendency to act upon it after the manner of a long pillar, which is to bend it. It is found with stonework and columns that when the height exceeds about eight or ten times the thickness, the tendency to bend begins, and after that long pillars have but little power of resistance, and in a brick wall this tendency would take the form of splitting it longitudinally. For both these reasons the bond should be stronger across the wall than lengthwise, but a practical consideration here comes in to modify these theoretical tendencies—viz., that it is difficult to ensure a uniform bearing power throughout the length of a long wall, and if this is not ensured, the tendency of the wall is to settle over the weaker parts, which is prevented by the strength of the longitudinal bond, if

it is sufficient. Now, seeing that where a great weight is intended to be carried the strength of the foundations receives special attention, a wall built upon such a foundation is the less likely to settle unequally in a longitudinal direction, and at the same time the weight, according to its intensity, has the greater power to split the wall, it appears, therefore, that for a wall specially intended to carry weight, cross bonding should be the first consideration, and for this purpose the old English bond of alternate header and stretcher courses is the strongest; but where a wall has not to carry much weight the foundations are less likely to be made uniformly firm, and the tendency to unequal settlement will, in consequence, be increased. In such a case longitudinal bond must be had, and then the old English form is not so good as if two or three courses of stretchers are laid to one of headers. This is still called English bond, to distinguish it from another kind called Flemish bond, which has a very much more pleasing appearance in a wall; it consists of alternate headers and stretchers in the same course; but the bond is not so good, either lengthwise or crosswise, as in the other method. For house building, however, or in any situation where strength is of secondary importance, the Flemish bond is preferable.



When one course consists wholly of headers there will be twice as many vertical joints in any given length of the wall as there will be in a course which consists wholly of stretchers; now, if the joints in the header courses are as thick as those in the stretcher courses, the over-lap of 24in. with which the course is started will soon be reduced so that

a vertical joint of the header course will come directly over one of the vertical joints of the stretcher course below, and the bond will be lost. To prevent this the side joints of the header courses should be drawn closer than the end joints of the stretchers, and whenever, despite of this, a vertical joint would approach nearer to one under it than a quarter-brick, a bat or closer should be cut so as to rectify the bond and gain a fair start afresh. These are the only situations in which bats are allowable in good brickwork.

The proper thickness of walls is often determined more by considerations of practical convenience than by calculations of strength; but still it may be determined by calculation in some cases. To take the simplest of all cases, that of a fence wall, the greatest force which it has to withstand is the pressure of wind. A high wind blows with a force of about 5lb. per square foot; a very high wind, 9lb.; a storm, 12lb.; and a great storm, 20lb. If we take a 9in. fence wall, 6ft. high above ground, the footings of which are laid 1ft. below the surface, we may see whether it is capable of resisting such a wind in the following manner. Let Fig. 5 represent such a wall. The force of the wind against it in pounds per foot of its length will be twenty times its height in feet, = $6 \times 20 = 120$ lb. This force spread over the height of 6ft. has the same effect in tending to overturn the wall on the toe of the outer footing as if its whole force were to act at a point situated at half the height of the wall above ground, or 3ft. This is the centre of pressure, and the leverage with which the pressure acts to overturn the wall is the vertical height of the centre of pressure above the base of the wall, which in this case is 4ft. The moment of force about the fulcrum or toe of the outer footing is therefore $120 \times 4 = 480$ lb. The resistance of the wall must be at least equal to this. Let us see whether it is so. The resistance is compounded of the weight of the wall multiplied into the distance of its centre of gravity from the fulcrum about which the force of the wind tends to overturn it. The centre of gravity of a uniformly thick wall is in the centre of its thickness. In this case the distance of the centre of gravity from the fulcrum is 9in. The weight of the wall is:—

First double course	
of footings	1.5 ft. \times .5 ft. = .75 sq. ft.
Second ditto	1.12 ft. \times .5 ft. = .56 "
Wall	6.00 ft. \times .75 ft. = 4.50 "
	5.81 sq. ft.

The weight of the wall per foot of its length, supposing each cubic foot to weigh 112lb., will be $5.81 \times 112 = 650$ lb., acting at a distance of .75ft. from the fulcrum. The moment, therefore, is $650 \times .75 = 487$ lb. Contrasting this with the moment of force (480lb.), we see that such a wall will just withstand the fury of a storm blowing with a force of 20lb. per square foot. In a similar manner it may be found that a garden wall 10ft. high, having a thickness of body of 9in., needs to have pilasters of 18in. \times 4½in., 10ft. apart, on each side, to act as counterforts, and footings 3 bricks in width.

Walls for roofed buildings carrying floors for ordinary purposes—i. e., excluding floors for heavy machinery or other extraordinary purposes—may be graduated downwards in the following manner: For the top story, 1 brick thick; for the next two stories, 1½ brick; for the two stories below that, 2 bricks; and for the two lowest stories, 2½ bricks.

THE ROYAL ACADEMY.

DISTRIBUTION OF PRIZES.

THE annual distribution of prizes to the successful students took place on Saturday last in the lecture theatre of the Academy. This year being a gold medal year the event was looked forward to with more anxiety than

usual, and there was a large attendance of students and their friends. Some of the recipients of prizes had considerable difficulty in making their way to the President, in consequence of the crowd. The arrangements were somewhat better than they were last year; whether this was occasioned by it being a gold medal year or by our remarks on a recent occasion we cannot say.

The President's address (if address it could be called which shape had none) was, as usual, feeble and uninteresting. He praised the architectural drawings in an unnecessary way, and passed listlessly over the landscapes, which were nearly all of unusual merit. His remarks to the students in presenting them with their rewards, when audible, were singularly infelicitous. Exception must, however, be made to his compliment to Miss Jessie Macgregor (the winner of the gold medal for the best historical painting), which had the additional recommendation of being thoroughly deserved.

The following is a list of the prizes in the architectural school:—The gold medal, books, and scholarship of £25 for one or two years. Subject: "Design for a Building to Accommodate the Learned Societies." Motto: "Absque labore nihil." William Goldsworth Davie.—The silver medal and books. "Section and Plan of the Round Portion of the Temple Church, London," on whole sheet of double elephant paper, with rough outline and figured dimensions. Motto: "A.D. 1185." Arthur Hill. Travelling studentship of £100 for one year. "Design for a Museum of Natural History." Motto: "Dum spiro spero." R. Selden Wornum.—Silver medal. "Perspective Drawing of the Choragic Monument of Lysistrates and Specimen of Sciography." Alexander Henry Kersey.

The two successful designs are both Gothic, and it is curious to observe the increasing favour with which this style has been regarded by the Academy since Mr. Street's election as Academician. Mr. Davies's building for the learned societies is heavy and ungraceful in outline; the central tower is disproportionately large for the front, and terminates too abruptly. The drawings are laboured, and the colouring is opaque and heavy. This last defect the author has endeavoured to overcome by a liberal use of body colour on some of the sheets. The figures of the statues are clumsily drawn, and being mounted upon very tall and slender columns, have an awkward appearance. We much prefer the design "An bon droit;" the plan of this is not so well studied as the preceding, but the elevations (which remind one of Mr. Burges's design for the Law Courts) are very skilfully composed, and are superior, both as to the drawing and colouring, to those of the successful competitor. "Che sara sara" is a weak design in the modern French manner, with an Academic plan and an ugly theatre.

"Thorough" is a Classic design of no particular date; it bears some resemblance to Palladian, but is confused and unsatisfactory. The plan is thoroughly Classical, the lighting of the rooms being sacrificed to the requirements of the elevation. The various apartments are arranged around a quadrangle with a public library and large public hall over in the centre, in a detached block, connected by a corridor, on the ground floor only, with the rest of the buildings. The drawings are slovenly in execution, and the perspective view is finished in pencil.

"Alta petens" is Gothic, both in elevations and plan. There is a grand central hall, approached by a spacious vestibule, with a theatre in the rear. The style of the design is confused in parts, but it has a certain air of solidity and massiveness which is impressive. The enlarged perspective of a portion of the building is admirably drawn, but the other drawings are not so good.

For the medal offered for the best drawing of the Temple Church, London, there were but two competitors, "A.D. 1185" (Arthur

Hill), and "Simul." The drawings by the successful student are by far the best exhibited; they are beautifully clear, not over-laboured, and the details are drawn with a firm and vigorous hand.

For the Museum of Natural History two sets of drawings were sent in; the successful design by Mr. Wornum ("Dum spiro spero") is Gothic, and is an extremely commendable work. The plan is well arranged, and the elevation, although a little too much broken, is very agreeable in design, and is clearly and artistically drawn. The perspective is rather timid, but the drawings, upon the whole, are very creditable.

The unsuccessful design ("Bruce's Spider") is of the school which has been called by the French "Neo-grec." The drawing is careful, and the shadowing and general get-up of the design testify to the careful study and patience bestowed upon it, but it is vastly inferior to its rival in invention and artistic treatment, and has been deservedly put in the second place.

DILAPIDATIONS.—VII.

LAY.

SURVEYORS.—EXPLAINING THEIR DUTIES, AND CONTAINING ALSO MUCH PRACTICAL ADVICE.

GWILT, in his "Encyclopædia of Architecture," says:—"The architect, in the course of his practice, is frequently called upon—and he must undertake the task, however uncongenial to his feelings—to ascertain the extent of neglect of a tenant in keeping his premises in proper order according to the covenants of the lease or agreement under which he holds the property." Certainly the foregoing will not give the young practitioner a cheerful view of this part of his profession; but there is a more grave question even than personal feelings, as the following extract from Woodfall will show:—"If a surveyor make an estimate, which turns out to be incorrect to a considerable amount, and consequently entirely useless, through his omitting to take reasonable precaution in forming his judgment, he is not entitled to recover anything for his plans, specifications, or estimates made for his work;" and then Woodfall advises, as the safer course, that the client pay the surveyor the agreed or demanded sum; and then continues, "Afterwards bring a cross-action for the negligence and want of due care and skill."

That the architect will often find unpleasantness, I must admit; but I do not suppose there is more than exists in all pursuits. Of course it cannot be congenial to one's feelings on a hot summer's day to have to enter and stay in rooms of the poor, where ventilation even in summer is looked upon as an unwelcome guest, and carefully excluded; to clamber over sooty and dirty roofs, to squeeze yourself through cobwebs and unused trap-doors; to go into heated bakehouses and smelting-furnace-houses; to take details in malting-houses in full operation. But it is not summer always, and in winter my reader may think it is better. Well, it is in some respects: although to find oneself desiring to make entries of dilapidations on roofs, in out-buildings, empty houses, and extensive fields and grounds on a frosty morning, with the fingers benumbed, would almost make one long for the return of objectionable summer weather. But were these all the objections, they would be light indeed. The real worry and trouble I will explain by-and-by.

A priori, the surveyor should provide himself with an appraiser's license; although in all probability he will find it useless, still, it would appear that if he acts as an appraiser within the meaning of a certain Act (46 Geo. III., c. 43) he cannot recover his charges unless he be licensed as an appraiser, or as an auctioneer. It is only as regards his own fees that the licence is necessary, and it would be, I should hope, difficult to find a client who would object to pay on such a ground.

In ordinary course, the client comes to his surveyor, to say either that he wishes to take a house on lease, or that some property he has let on lease he has seen, and finds out of repair, and wants advice, or he wants to buy an estate, &c. The surveyor will, if it be to take a house on lease, then go carefully over the premises, specially see to the construction (see page 404 *ante* for the method of taking these items and those which follow), and then price out what in money it would cost to avoid dilapidations; and in continuing the treaty for the taking the lease, this amount will form a portion of the calculation of value. If the matter be where premises are let on lease, and have been suffered to go to decay, he will visit and take an account, and if the term unexpired of the lease will permit so much delay, and there seems a fair desire on the part of the lessees to meet the necessary requirements, he will serve the three months' notice to repair. At the end of such time he will again visit the premises, and see if the works are not only done, but also if they are *properly* done. He then reports result to his client. If it be the purchase of an estate, again the duty of the surveyor will be to make a detailed account of the dilapidations, or in some cases a rough estimate will be sufficient for the purpose, and the valuation of such dilapidations should be of great advantage in the negotiation. It will so often be found that vendors and would-be lessors see no defects, or only what they choose to call trifling matters; while if it is surveyed by a professional man and shown in detail, they are generally willing to meet the case fairly. Again, sometimes lessor and lessee, or vendor and vendee, or intending lessor and lessee, agree to leave the specification of works to be done, or the money to be paid or allowed, to be determined by their respective surveyors, or their umpire (to be chosen in the usual manner). This is the very usual mode of settling dilapidations and waste at the expiration of a lease or tenancy. The process is thus:—The two surveyors first nominate their umpire, which should, remember, be done in writing, so that no question can arise on this point afterwards; and also the gentleman selected should be written to for the purpose of obtaining his consent to act. Where time is important, as where it is desired at once to proceed with the matter, it is a very good plan to nominate a second umpire, embodying his name in the written appointment thus:—That if A B should not consent to act, or become incapable, then C D be the umpire. The two surveyors meet and go over the premises, taking the items *seriatim*. It is not always done, and cannot be required, but it will save both surveyors much time if one makes his schedule before the meeting, and at the meeting gives his opponent a copy, as each then can so easily make a note against the objected matters. It will also be the best course for him who is making the claim, as he will be less likely to miss any dilapidation, which in the heat of discussion or friendly discourse he might do. In usual course the claimant's surveyor prepares such schedule. Where this is not done each surveyor must enter, as he goes through the premises, his own view of the dilapidation, and he should also enter his opponent's assent or dissent therefrom, and the reason (if any), and also all additional claims, or any sets-off he may make. The duty of the surveyor may sometimes be most trying, especially when meeting a brother professional for the first time. Here, then, I would give a little advice. Do not be unyielding because you have made a demand and your opponent (a rather harsh term, perhaps, but still there is little doubt you will often be in friendly, if not less pleasant opposition) has pointed out that the demand is excessive, but give way at once. Every practitioner has his own views; try to meet them, and you will generally find you will receive consideration in return, and thus,

while making the meeting more pleasant, best serve your client's interest. Avoid mixing yourself with any quarrel between the clients; you cannot do your duty fairly if you do, and it is not gentlemanly. Your duty is *outside* all questions, save only to determine those which are left to you and your opponent. It only concerns you, then, that he should treat you with courtesy to entitle him to receive from you similar treatment. Do not be afraid to stand by your opinion because your opponent is dictatorial, as "Oh! that's ridiculous; can't be; that's no dilapidation." No doubt you will find some who will feel disgusted with you if their simple *ipse dixit* is not taken as final. Ask such for their authority, and you will generally find, as with most men of that *genus*, they have none, but they reply "*it is so*." In such cases, I need hardly remind my reader, there is but one way open—namely, refer that item to the umpire. As cases in which one has played a part, instruct more perhaps than rules, for the same reason, probably, that lessons from history or biography sink deeper into the memory than those from novels and romances, I will mention one. My opponent, I found, when I handed him a copy of my schedule, in a most uncompromising spirit (parenthetically I may say it was most unpleasant weather, a cold and wet November day), and in the room we commenced with, objected to every item. Well, some were so palpably right, that I was at a loss to discover the reason or how to proceed. Instead of insisting on the items, I had already tried to make progress by saying, "Well, let us see how many things in this room we can agree to," and it was thus I had obtained an adverse opinion on nearly all. "Well," I said, "it will take us several days to discuss item by item, supposing we put A for those items you agree to and O against those you object to, and meet at either of our offices and discuss them there?" We began, and on the first page there was scarcely anything but the O's, and I saw him begin to waver, being astonished at the appearance of the schedule, and he then said "I am not sure about such and such an item." I said, "Well, let us call that doubtful, and put D against it in our schedules." So on we went with the three letters, the O being almost entirely discarded. In our meeting afterwards we settled the matter most pleasantly, my opponent and I shaking hands. If the umpire is called in be sure when it is your turn to explain why you demand or object to such dilapidations, *be short and to the point*; it is more businesslike. I would here observe that when fixtures are left on the premises at expiration of the term, and a new lease granted, in which there is no mention of any reservation to the lessee of such fixtures, they become part of the freehold. Surveyors must be very careful as to this when their clients are about to renew.

UMPIRE.

Remember, if you are acting in this capacity, your duty is to listen to both sides, to be most impartial, and to have no prejudices. You need give no reasons for a decision; in fact, it may be as well to remember what the celebrated Lord Chancellor said, "*Never give a reason for your decision.*"

Make a note of any point or objection you are uncertain about, so that you may consider it afterwards.

Do not talk much, it occupies so much time; the great thing is to listen to both sides. Of course now and then a pointed question may be most wise, or even a supposititious case, so extending a false argument as to reduce it *ad absurdum*. Pithy remarks are most useful in drawing forth short answers, and if the umpire is quick and to the point his very example will almost necessitate the other surveyors following it. Examine everything minutely yourself that is in dispute, no matter what labour or time it may involve. In no other way can you do your duty.

Try to make both the surveyors see the

matter fairly; this may often be done by carefully judging their characters, as very many disputes arise from temper, want of courtesy, and want of judgment; and where the umpire takes trouble to explain and inquire he will sometimes, and indeed most frequently, carry the opinion of both surveyors with him. This is a great triumph if accomplished.

I need scarcely say respect the important position, and require deference shown.

Require almost the same evidence that would be required by the highest legal authorities. It is no doubt true that to judge evidence, requires extended reading, knowledge of mankind, and carefully educated powers of analysing and justly weighing facts; but as the acquisition of all such knowledge will conduce to the general ability of the surveyor, and to his attainment of that high position in his profession that all should aspire to, he will see that the knowledge, though here acquired for a limited purpose, must be most advantageous to him.

PREPARING FOR ACTIONS.

Assume that the surveyor is met by simple refusal on the lessee's part to do such repairs as will satisfy the dilapidations, or any repairs at all, or by his *vis inertiae* leaves things as they are. Well, what can I do, says the young practitioner? Can I insist on entering and taking any account? Thus much may you do: You can enter and take an account of the wants of dilapidations and waste at any reasonable time, provided, of course, the right is reserved, as it usually is, in the deed. But as the occupant may refuse the surveyor permission to view some portion of the rooms or premises, if he has not previously given notice of his intention, it will be wise to give a written notice of such visit. Mind and be punctual in your view so that no question can be raised on that score. Where the covenant is to enter so many times a year, to survey, &c., recollect you may select any days in the year you choose without reference to their suitability for doing the repairs (case, *Hill v. Barclay*, 16 Ves., 403.) You can then serve the usual three months' notice (seeing that this is the time required by deed, if you intend to act under this covenant) and prepare for action by getting other technical evidence at end of the time if notice not complied with.

Other points I would note, as they are very important. You must not advise your client to enter and do repairs on his sub-lessee premises, even where they refuse, *after notice*, to do them, unless they will permit it. Your client may thus lose a most valuable estate because his sub-lessee refuse to repair a portion, and though he may be willing to repair such portion at his own expense. Yet such is THE LAW, and yet further to show how carefully we must all walk when we come within that "charmed spot," should you enter and do the repairs, and so save the estate (which I have done on several occasions by using persuasion, *not force*), you can require, and law will enable you to recover the very outlay from the sub-lessee, although, as I have said, you have no right to enter and make such outlay. You must show at the trial, of course, that repairs were absolutely requisite to be done to prevent a forfeiture of the estate, and you can then recover all the money laid out in *necessary* repairs, as damages sustained in consequence of sub-lessee's breach of contract.

It is HELD that where you advise an action not of ejectment for dilapidations or for waste, but to obtain a sum of money equivalent for the damages existing at the time of action, that you can obtain substantial damages (case, *Luxmore v. Robson*, 1 B. and A., 584). While, however, Woodfall holds this view, strengthened by this case, it appears clear to me the case cited would be overruled now, and that, at most, merely nominal damages would be given. Remember

repairing covenants will not extend to fixtures. In making your schedule, recollect you must consider the state and the age of the premises at the granting of the lease, as you will have to defend it on that basis. I cannot do better than quote from Grady *in extenso* on these two points. He says:—

"A covenant to repair must be construed with reference to the state of the premises at the time the covenant began to operate; and, therefore, where an under-lease had been made with the same covenants as those in the original lease, allowing an interval between them, it is clear that the covenants would not have the same effect, but would vary substantially in their operation, for the sub-lessee is only bound to put the premises in the same condition as he found them at the time of the lease to him. See *per Parke B.*, in *Walker v. Hatton*, 10 M. and W., 257, 258, and the cases there cited, *post*, pp. 395, 400."

"*Age of Premises.*—In construing a covenant to repair, the nature and condition of the premises as to age, &c., ought to form a subject of consideration. *Tindal, C. J.*, told the jury that the defendant was only bound to keep up the house as an old house, and not to give the tenant the benefit of new work. *Harris v. Jones*, 1 M. and R., 173."

To show that great difficulty may beset the surveyor in advising his client, I am tempted to mention a case. The lessee covenanted within two years from the date of the lease to put four messuages in good repair, and keep them in repair during the term, and beyond such covenant that he would within the first fifty years of the term take down the messuages, as occasion may require, and in the place thereof erect four new messuages. The Court of Common Pleas intimated that if, within the fifty years, the houses should be so repaired as to make them completely and substantially as good as new houses, the "occasion" on which the new houses were to be built did not arise (case, *Evelyn v. Raddish*). Yet I venture to affirm that scarcely any one could have anticipated such an *intimation*. Far more likely would it have appeared that the lessor would be entitled to new bricks, new timber, and altogether new houses; therefore clearly he must have them at the end of fifty years, and the words "as occasion may require" only mean that they are to be built earlier than that period if necessary. This would have been a decision more in accordance with the original intention of lessor and lessee. If a lessee have an action brought against him because the sub-lessee has failed to keep in repair, the lessee has a right of action against him for the amount of such damages; but the latest case does not entitle him to recover the costs, because he should not have defended the action, where there was no real defence (cases, *Penley v. Watts*, and *Walker v. Hatton*).

Remember dilapidations and waste must *exist* at the time of action. Be sure you do not claim for fence walls that do not appertain to the property.

Where lease expired and premises left dilapidated, you, if acting for lessor, may claim money for the loss of use of the premises while they are being reinstated.

Lastly, surveyors must bear in mind that dilapidations and waste may occur not only in lands and houses, but in gardens and orchards, timber trees, dove-houses, warrens, parks, fish-ponds, and other subjects of property, and he must therefore be careful to note them all. B. F.

[Answers to questions next week.]

THEORY OF THE ARTS.

PLASTIC SUBSTANCES AND ARTIFICIAL COMPOUNDS.

(Continued from page 425.)

BEFORE entering into the decorative treatment of these materials, it may be well to notice the important question of the admixture of the different ingredients forming mortars, cements, and succoes. First we have lime, the cementing ingredient. Dr. Higgins—an authority of no mean order—says the harder the limestone from which the

lime is obtained the better; that which dissolves the quickest, and falls into the finest powder, is the best. Long exposure to the atmosphere before use destroys its cementitious property; indeed, for mortar, unless used quite fresh it is worthless. As slaked lime absorbs carbonic acid in proportion to its texture, stone lime being the hardest absorbs it less quickly, and is therefore preferable to chalk lime. The whiteness of the slaked powder also shows its freedom from metallic impregnation, and with the above tests of its calcination the purity of the lime is at once discovered.

Sand, in the composition of mortar, being the material cemented or combined, performs a more important office than generally given to it. The action of the lime through the agency of the water is best attained when the interstices formed between the adjacent sides of the particles are filled, and the compactness and hardening of this composition depends mainly upon the closeness of the particles.

This compactness of the particles of sand further excludes the atmospheric agencies of moisture, frost, &c., which, by the destructive forces of expansion and contraction, have such an injurious effect on materials of this sort. A proper combination of the component ingredients, which must also be of the right kind, is therefore essential to ensure this desideratum. Dr. Higgins and others have shown the proper proportion to be observed in these ingredients, or namely, one part of lime to five, six, or seven of sand. The proportion of sand depends on its nature and size; pit sand requiring more lime than sharp clean road drift or river sand, and, as a rule, the coarser the sand, the less lime required. Builders use far too fine a sand, and when such is wanting in sharpness, a miserable mortar, that crumbles at the slightest pressure, is the result. I have found invariably a coarse sharp sand or even gravel much better than fine sand, and have observed some capital hard mortar composed of fine rubble in some ancient Mediæval buildings. Sand, indeed, seems to form the principal element of mortar, considered as a solidified composition, while an undue quantity of lime impoverishes it; the mortar undergoes greater expansion and contraction, and it is infinitely more retentive of moisture. Dr. Higgins found experimentally that the best specimens of mortar contained the least quantity of well-burnt lime, that is, one of lime to six of sand, about half the proportion of lime ordinarily used in the preparation of mortar. Indeed, the reasoning upon this matter agrees with practical facts. It is only necessary to use as much lime as will cement the grains of sand together; the lime being the substance whose intervention is required to make the particles cohere. Again, calcareous substances, which make lime much less hard than those stones composed of quartzose or siliceous particles, and therefore the aggregation of the harder bodies (sand or quartzose) by the simple coherence of lime cannot form such a compact mass as that in which the harder bodies are closely packed together, and when further assisted by the irregularity and angularities of the particles, as in the case of coarse sharp grit or gravel. It is, then, indisputable that the best mortar or concrete is composed of the greater quantity of hard solid angular bodies (as masonry itself) cohering by the aid of the thinned intervening medium of calcareous matter; or, in short, the hardest composition is that in which the hardest component forms the largest proportion of the aggregate. Cracking is frequently the result of the large quantity of lime in proportion to sand that is used. This, of course, is through the great absorption of water by the lime and the after contraction that takes place, whereas stone or sand does not imbibe water nor increase in volume. Besides these self-evident facts, it is clear that as the induration of mortar depends on an atmospheric gas it gradually

absorbs, the less the quantity of the substance of affinity the better, the induration being quicker. The sand Dr. Higgins most recommends is that obtained from the "bottoms of fresh water rivers or from beds of rivulets, known by the name of 'silt.'" Speaking of sands of mixed kinds, coarse and fine, after a series of elaborate experiments founded upon the rational theory that the hardness of mortar depends on lessening the interstitial space between the grains of sand, this authority says the mixture of four parts of coarse and three of fine sand, and one part or a little more of lime, composed the best mortar, being more plastic and closer in the grain, and this proportion was better than any other of the sand and lime for incrustations. A greater measure of lime is useless with the coarser and injurious in the finer sands. Hence it may be taken as an established fact that mixtures of coarse and fine sand are the best, and that the strength and durability of calcareous matter is best ensured by sand, as it withstands the action of any saline matter the atmosphere holds.

As the induration of mortar depends on its absorption of carbonic acid gas from the atmosphere, it is necessary that the lime should receive not less than one-third its weight of water, and such water should, according to Dr. Higgins, be lime-water, as common crude water often contains the acidulous gas which destroys the value of lime before use. The tenacity of mortars may be increased by the addition of various substances, such as ashes, scoræ, iron scales, pulverised potter's ware, &c., which are preferable to ordinary lime mortar for bedding timbers from the injurious effect lime has upon wood.

For internal plastering purposes a rather different composition is required, as appearance of surface besides hardness is an important consideration in all incrustations. To prevent blistering some plasterers keep their mortar a considerable time before using it. This is done on account of the greater quantity of lime used, and its consequent liability to imbibe unequally the acidulous gas after being applied. To give also a fine texture and colour to inside stucco, a finer kind of sand is necessary, and flint powder and bone ashes mixed with lime and lime-water in the proportion of 5 to 1 makes an excellent white surface or finishing coat. For exterior incrustation, however, a coarse sharp grit is indispensable for the reasons advanced when treating of mortar.

It is unnecessary here to treat of the various qualities of the calcareous stuccos used by plasterers, but the architectural student cannot do better than study Dr. Higgins' treatise or Mr. Austin's compilation,* which abounds in valuable experiments and compounds of the most useful character.

The decorative treatment of plaster or incrustations, applied either internally or externally, involve principles of design dissimilar in most respects from those more constructive branches of the art before treated. There is less of the direct suggestion of constructive use to guide us, and mere fancy is more the predominant genius that presides over our ideas. Hence designs the most flippant and fanciful are conceived, and the plasticity of the material lends to such unrestricted freedom still greater latitude. But these vagaries are not consistent with the proper office of this material. First we may consider it in its most useful character, that of a covering or incrustation to our walls or ceilings. Now a wall covered with plaster should not be disguised as to its construction—that is, *breadth of surface* should be paramount. Relief it may have, but such relief must be superficial, wall-like, not high relieves of flowers or figures appearing to be stuck on or jutting from the walls. I am speaking here of wall surfaces exposed to wear and use, not wall decorations, as cornices, panellings, friezes,

and the like. The top edges or crownings of walls, so to speak, come under another category. Wall relief, then, should, I think, be such as to convey *breadth* of surface rather than a breaking up of it; and hence nothing suggests itself to the mind more readily than shallow, conventional forms or impressions, such as panels, or simple plain diaper patterns moulded or impressed. The wall may be made to effloresce above the line of rub and wear; but this efflorescence or decoration should be of a superficial character below, and never be too varied, and the eye should rest on broad surfaces rather than become distracted by labyrinth of ornamentation or excrescences.

Ceilings certainly admit of greater variety of treatment than generally observed. Stamped or impressed diapering or panelling, and even imitative enrichment, may be employed with some degree of reason in such a position. The eye is frequently directed upwards in thought and contemplation, or diverts itself in pensive moments from engrossing cares. Our ceilings, in fact, become an important part of our domestic life; surroundings and indoor occupations of a wearisome kind may be beguiled and relieved by ornamental ceilings. The eye and mind can rest here, and utilitarian ideas not thrusting themselves upon the senses, fancy may often indulge itself without appearing distasteful.

G. H. G

Erratum.—In reference to the ratio of strength between Portland and Roman cement in last paper, for $2\frac{1}{2}$ to 8 read $2\frac{1}{2}$ to 1.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY, 1871-2.

PRESIDENT'S ADDRESS.

THE following are the chief portions of the President's (Arthur C. Pain) address, as delivered on Friday last:—

The tide of engineering work has again taken a favourable turn. I am glad to say confidence has once more been placed in railway and other public works; but a strong feeling exists in the investor's mind that everything ought to be cheap. There can be no doubt that too much money has been spent in times gone by, particularly on railways; but let it be remembered that if you have a line to lay out which will take a heavy traffic, particularly in minerals, at low rates, those low rates will only pay if the line is an easy one against the load. Steep gradients on a main line are objectionable, not only on account of the small trains only which can be taken, thereby increasing the cost of working; but it delays the general service of trains, and causes at times the most fatal accidents, entailing great loss of life and property. It is better to wind and get good gradients than take it straight and have bad ones. And while on the subject of main lines let me touch on the construction of the carriages used for long journeys. No person can but admit that we are far behind the Americans in this respect. Why should not we have sleeping carriages on the routes to the North, to Holyhead, to Plymouth, South Wales, and many other places? Who among us has not experienced the discomforts of a night's journey in a first-class carriage, and if full of discomforts in the first, how much worse in the second and third-class, huddled up together, obliged to sit upright for hour after hour, nearly perished with cold in the winter, or nearly suffocated in the hot summer nights, arriving at your destination worn out? Whereas if by a small extra charge a place could be secured where you could lie down at full length and rest, obtained with proper ventilation, and the air warmed if necessary, how much fatigue might be saved! Time was when people went to bed properly every night of their lives very nearly; time is when the greater number of the long journeys are made in the night.

I believe it would pay the companies to introduce sleeping carriages, but no one of these great corporations will move in the right direction, and there is no powder to make them do so.

But to return to the original subject. If steep gradients cannot be avoided—and there are many places where the nature of the country is such as renders it impossible to lay out a line without them—then I think the central rail or Fell's system might often be brought into more constant use than it is, and with great economy. At the same time, I believe that, a first-class line, if it is physically possible, is

* Published by Triebner & Co.

the cheapest in the end if there is a heavy traffic to be carried at low rates. Where, however, the traffic is light, steep gradients and light works are very proper things. I confess I do not like a break of gauge, and I cannot see that a saving in first cost is effected thereby—say, by making it 3ft. 6in. instead of 4ft. 8½in.—commensurate with the disadvantage of the transhipment of the goods from one truck into another of a larger or smaller gauge. If a line is taken say from a coal-field to a port for shipment then it does not matter, or in any case where the material to be moved is taken from one fixed point to another fixed point; but if the coal is to be sent not only over that particular system of railway, but over a number of other lines, and this is applicable not only to coal but to all general merchandise, then I consider the gauge should be the same. The requirements of the Board of Trade as regards level crossings, gates, keepers' houses, expensive signals, fencing, &c., increasing the cost, all tend to prevent the free extension of light lines. The Railways' Construction Facilities Act of 1864 is a step in the right direction, but it is made almost worthless by one clause, which obliges the promoters to obtain in writing the consent of all the landowners on the route; this is almost impossible to get, except in a few cases where the land belongs to a few large owners. If this is not the case there are generally one or two landowners who won't part with their land at any price. I have a line in hand which is a case in point. Near where the line begins by a junction with an existing main line, we go through the lands of two farmers, and both refuse to sell the land, for they say "We have a station close to us already; your line won't do us any good, but will cut our land in half." It is of no use to tell them they ought to consent for the good of their neighbours higher up; they won't sell, and in consequence, if we want to make the line we must spend about £600 at the least to get an Act of Parliament for compulsory powers. Now, if the clause ran, that, if for two-thirds of the total length of line the owners would agree to sell the land, then the remaining third should be made to sell, on the necessity of a line being proved before the Board of Trade Inspector, I feel sure a large number of lines would be constructed that never will be made until some such clause is inserted, but which would be of great value to the district affected. I think a great saving in the cost of construction of public works, both heavy and light, might be made by a more extended use of concrete for walls, bridges, viaducts, &c., in place of brick and stone; gravel is so generally found in all geological formations that there are few places where it cannot be obtained, and if properly mixed with good lime or cement it is quite equal in strength to those other materials generally used. But it is a material that unless well made is very unsafe; worse than had brick or stonework. After light railways come tramways; these, I think, are more suited to towns than to the country, for let it be remembered they are very expensive to make if pitched on each side of the rails, and without pitching rails are soon formed at the edges of the rails, which are not only bad for ordinary road carriages, but dangerous of a night when they cannot be seen. It may be said that as they answer in America without pitching on each side, why should not they do here? The answer to that is, that in America private carriages are little used, and to heavy carts it is not of so much matter, working as they do in the day mostly. For towns where the traffic is large, tramways are unequalled.

The present system of sleepers and cross-ties, as used in London, is very defective, I consider, and will entail heavy and costly renewals. Cast iron feet will, I expect, be used largely, alternately, instead of timber sleepers.

Wire tramways are well suited for carrying any materials that can be shifted in small quantities at a time, and where the country is so rough that a tramway on the ground could not be made. I recently saw one at work in the Forest of Dean, and was much pleased with it, but the mechanical details are capable of great improvement. The line was about one mile in length, and over very rough ground indeed; the material carried was iron ore.

For mining purposes in new countries it will no doubt prove a most valuable invention. The great element of cost appears to be in the wear of the rope.

Canals, where there is a large heavy traffic, which does not require to be moved quickly from place to place, are found to be able to compete with railways, and I expect next year we shall see some large schemes for new canals brought forward. Ship canals are being again proposed, no doubt in a great measure owing to the success of the Suez Canal in an engineering point of view drawing public attention to their advantages.

The construction and repair of public roads, since the death of Telford and Macadam, has not received so much attention as the subjects are worthy. Indeed, it is questionable if we have not gone back rather than advanced in this respect. Owing, perhaps, to the fact that the public think any person can make a road. That this is not the case is at once proved by a comparison of the roads constructed in a proper and scientific manner by Telford, Macadam, and others, following their systems against many of those of the present day.

The streets of London and other towns in wet weather are a disgrace to the authorities who have the charge of them. The system of laying the pitching is the most absurd. First the cubes of granite are set in gravel, and then hot lime and sand is grouted in; before it has time to set, an army of rammers go to work to heat them to a firm bed, but what is the result? The lime being hydraulic won't reset, and is worth nothing as a binding medium. The road is then coated with gravel and the traffic shortly let over it, the object being to grind the gravel and mud into all vacancies between the stones. After a short time the continual stream of traffic pumps up the lime and sand, which have never properly set, and the result is the roads are nearly always in wet weather covered with a thick coat of mud, sometimes is a slippery, buttery state, or else a sea of slush.

Lately there have been several improvements in paving, one plan being to set the cubes with long strips of iron between, slightly sunk below the level of the stones, and the whole set with sand and tar; this plan answers very well, and gives good foothold to the horses. Another and better plan is to lay the roads over with asphalt, and if it is nearly a level road it answers very well, but on an incline it is as bad to drive down as up. Great objections have been urged against its use, but when it is more generally adopted, I believe both horses and drivers will like it; it does not afford heavy draught horses such good foothold to start their loads, but once started the traction is much less. Again, if kept clean, which can be done with little expense, horses do not fall often on it, and when they do, they do not injure themselves so much as by falling on pitching. In the construction or repairs of roads with broken stone, generally known as macadamised roads, the vital principle Macadam practised—namely, the making a proper foundation—is left out.

Steam rollers have been lately brought into much use, and any person who has seen a road before and after the rolling must but confess that it is a wonderful improvement. At the same time I think a great mistake is made in using sandy gravel with the stone. I believe a road thoroughly watered and rolled would set closer and firmer together without the use of gravel than with it. As far as I am aware, this has never been tried. After the road has been made it should be allowed to dry for a day or so and harden before the traffic is allowed to go over it. If this is not done it is apt to work into ruts and be kicked up by the horses' hoofs.

The concluding part of the President's address referred to coal and sewage.

CONCRETE WHARF AT BATTERSEA.

THE remains of many ancient buildings and engineering works afford ample evidence of the antiquity of the art of constructing in concrete. This practice, however, as regards superstructures appears to have fallen into disuse, and to have been again revived in very recent times, although foundations and superstructures have been executed in concrete for many years past. We have, says *Engineering*, lately examined an example of concrete work as applied to the construction of a wharf wall and basement story of a warehouse on the bank of the River Thames at Battersea. So far as we are aware, this is the first application of the system to works of this class in the present day, and it has been effected by Mr. R. M. Ordish, who was applied to for a design for a river wharf at the Patent Plumbago Crucible Works, Battersea. He decided on adopting the built-up concrete system, partly from experimental knowledge of the qualities of concrete when properly mixed, and also from having observed, when in Algeria, the remains of a barrage across the river Mina. Although this barrage was constructed by the Romans many centuries since, Mr. Ordish found that the marks of the mould-boards were still clearly visible on the face of the work. The wharf at Battersea belongs to the Patent Plumbago Crucible Company, the makers of Morgan's patent crucibles, and is an extension of the river frontage of their premises on to the foreshore of the river. The wharf is about 60ft. square in plan, and consists of a storage vault and a

building of three stories, which has been carried up in brick and iron above it. The floor of the concrete wharf is at the level of Trinity high water, the floor of the vault being 10ft. below it. The foreshore of the river was excavated to the hard gravel, upon which a bed of cement concrete 3ft. in thickness was laid. The roof of the vault, which forms the floor of the lower part of the superstructure, is also of cement concrete, and is carried on twenty-four brick piers. The vault roof is groined, and at the crowns the concrete is 1ft. thick. Openings have been left in this roof for communication with the wharf floor above, and are closed with wrought-iron flap-doors hinged to cast-iron frames. The floorings of the vault and of the ground floor of the wharf are both paved with 2½in. York stone.

The concrete walls are 3ft. 6in. thick at the base, and 2ft. 9in. at the top, the front wall having been carried 15ft. below Trinity high water mark, and all the walls terminating 3ft. 3in. above that level. Ordinary fender piles, provided with mooring rings, are held by 1½in. anchor bolts, 6ft. long, and which are built into the front and side walls of the structure. In constructing the wharf, the foreshore was first excavated, about 2,000 tons of stuff being removed. Fender piles were then driven, and afterwards a row of piles on the inside of the site of the proposed walls. Mould boards were then fixed horizontally against the piles, and the concrete was tipped in from staging. As the works were submerged when the tide rose, the construction could only be carried on between tides. As the work advanced, additional mould-boards were placed in position, and were removed as the structure progressed and the concrete set; in this way the walls were raised to their proper level. The concrete consisted of 1 part Portland cement to 4 parts Thames hallast and sand, and about 1,000 cubic yards were used in the structure. The cost of this portion of the work was about £2,000, showing a saving of something like 25 per cent. in cost as against brickwork.

As the first of its kind in modern times, this structure may be regarded somewhat in the light of an experiment, although a successful one. We visited the works both during their construction and after their completion, and found at the finish that though there were indications of moisture coming through one of the side walls, it could hardly be termed a leak. An examination of these damp spots, where the concrete had been cut out, showed that they were caused by unavoidable accident in mixing the material, some small portions of the concrete not having sufficient sand and small materials mixed with the ballast. The concrete being somewhat coarse at these points, permitted a slight percolation of moisture, which, however, was readily stopped by cutting out the defective portion, and filling in the space with cement. This wharf may therefore be considered a success, and will doubtless lead to the adoption of the built-up concrete system in future structures, of similar character, combining, as it does, strength and economy.

The upper portion of the wharf is carried to a height of 33ft. above the coping of the concrete walls. The side walls are of brick, the front being of brick and iron combined. Cast-iron columns carry breast-summings of the same material, the openings being filled in with brickwork and glass. The front is surmounted by a brick cornice, and presents a light and ornamental appearance. The floors are supported on internal cast-iron columns, and the roof is of timber, and is covered with a superior quality of slating produced from the Moelfra slate quarry, near Port Madoc. The lower portion of the front of the original building, against which the new superstructure abuts, was removed to a height of 18ft. for the whole width, in order to form an opening for connecting the new building. This opening left about 18ft. of brickwork above, which, of course, was underpinned. The contract for the superstructure of this wharf was taken by Messrs. Manley & Rogers, the cost being about £3,000, making a total for the whole work of £5,000.

ARCHÆOLOGICAL.

THE CRYPT IN BRUTON CHURCH.—During the progress of the work recently undertaken for the restoration of the parish church of Bruton, the workmen accidentally opened a large vault, which was recognised by the sexton as the family vault of the late Lords Berkeley. Numbers of people visited the spot, and among them some gentlemen versed in archaeology, who immediately pronounced it to be, not a common burial-place, but a crypt of beautiful proportions and of ancient date. It probably dates from the early part of the thirteenth century; and from the position of the doors and windows it is evident that it formed part of an older church, the present edifice, which is Perpendicular, of the thirteenth century, having been built over it.

DESIGNS FOR CHIMNEY-PIECES.*

WE have published at various times several illustrations of Mr. Hoskins's work, both in architecture and office fittings. The designs before us are of similar character, not devoid of merit, but exhibiting rather much of that kind of novelty which manifests itself in odd forms of notch and chamfer stop. We are constantly being reminded of our old friend the Strand Music Hall, and though Mr. Hoskins shows, on the whole, more sobriety than did Mr. Bassett Keeling, it is impossible to overlook the strong affinity of taste and feeling between them. A book, however, does not need to be perfect in order to be suggestive, and the prevalent patterns in chimney-pieces are so bad that we are inclined to welcome any attempts to supersede them. The present collection includes twenty-eight designs to inch scale, with details quarter full size. The series begins with variations on the common square jambs and shelf, which are shown variously splayed, scalloped, and cusped. Further on incised patterns in black cement are introduced, the design of which deserved more attention than it apparently received. Ornament of so conspicuous a kind needs to be well studied anywhere, and most of all in a sitting-room, where there is no getting out of its way. The corbelled lintel or Carnarvon arch is next adopted, and this gives a general form by no means unsatisfactory. Could we be spared the notings and the chamfer stops, some of the patterns under this head might frequently be useful. The corbelling out of the shelf, again, which Mr. Hoskins has here and there made a leading feature, might with advantage become commoner than it is. Instead of boxed jambs and pilasters, a couple of substantial and "practicable" corbels, really built into the wall, would be as valuable in design as they would be sound in construction. More incised ornament, with plenty of dots and arrow-heads, makes its appearance towards the middle of the book; and though not so poor as the first specimen, it leaves us asking for something better. The mind grows tired of unmeaning forms, especially when their beauty is none of the highest. Why, in a place like this, above all others, should we not have something with thought and feeling in it—something with an idea to vivify it—something, if not pictorial, at least symbolical? There is a secular as well as a sacred symbolism, of which, amongst other things, heraldry is an example: and the smallest piece of work that has feelings, and memories, and associations linked with it is worth more than the most elaborate display of soulless decoration. One need not look far in our poetry, our prose literature, or even our proverbs, to find subjects adapted to the purpose; and it will be a bright day for art when architects everywhere resolve to have no ornament without some sort of purpose and meaning to it. The majority of the designs in Mr. Hoskins's book are of the character we have mentioned; one or two of them, however, come about as near to Italian as the other do to Gothic, and these are slightly less *bizarre* than the rest. Few, however, of either class would harmonise well with any architecture but their author's. We hold it to be a general rule, at least in the present disorganised state of the art world, that house fittings and houses ought to go together, to be designed not only in the same style, but by the same hand. There are, indeed, some architects—we wish there were more—who run so closely side by side that the ideas of each might be interchangeable. Mr. Hoskins, however, deviates too far from any of the more frequented tracks to find many with whose works his own will harmonise; and if his ideas are ever carried out with the accuracy for which he has provided in his drawings, it will probably be by manufacturers or builders. We are bound to say that the first examples are not the best, and that to form a fair judgment it is necessary to examine the whole. The author is more happy with his mouldings than his chamfers, and pleases most when he is least anxious to astound. Taken

by themselves, the Mediaeval-looking chimney openings, weathered back to the wall, are amongst the most satisfactory. The architecture of a modern drawing-room, it is true, would need some re-casting before they would seem quite at home in it; but their type, as it occurs in the Early Domestic buildings of France and England, is picturesque, and might be made convenient.

COMPETITION FOR HOUSE PLANNING.

IN accordance with our promise made some weeks ago, we have arranged the details of a competition for the best types of house arrangement. Instead of one premium, however, we offer two, for different descriptions of houses. The question of planning is the main one to be considered in the present competition, and excellence in arrangement will so far take precedence of excellence in detail. But at the same time it is impossible to decide fairly on the merits of any plan without considering how it will work out in the other plans, and in the elevations and sections of the building; and of arrangements nearly equal in convenience, that will be held the best which, both practically and artistically, is proved to issue in the best general design. The conditions of the competition are the following:—

1. A premium of five guineas is offered for the best plan, illustrated as will be further explained, for a Mansion, the cost of which is not to exceed seven thousand pounds; and a second premium of five guineas is offered for a plan similarly illustrated, of a Detached Villa, the cost of which is not to exceed two thousand pounds.

2. The designs are to be sent, under motto, with the author's name in a sealed envelope, to the Editor of the BUILDING NEWS, on or before Saturday, the 2nd of March, 1872.

3. To secure a uniform standard for estimating the cost of designs, it will be assumed that the mansion will cost one shilling per cubic foot, and the villa eightpence per cubic foot—the cubical contents being those of the whole building, including walls, roofs, and chimneys above the ground line.

4. To avoid unnecessary labour in the matter of drawing, the plans are to be drawn to a scale of twelve feet to an inch. The elevations and sections may either be to this scale or to a scale of eight feet to an inch. Drawings are to be in Indian ink, without colour; and for facility in photo-lithographing, any tints or shadows should be etched in lines, not laid on in washes. Each set of plans, elevations, and sections is to be drawn on a single sheet of imperial.

5. The drawings required will be a ground plan, a first-floor plan (on which the method of roofing should be indicated by dotted lines), a section through some of the principal apartments, and two elevations. The sending of perspectives is optional with the competitors; but if sent, the rough plan from which the perspective was prepared, having on it a line indicating the picture plane, and marks showing the distance of the station, and of the vanishing points, must accompany them as a guarantee of correctness.

6. The positions intended for the beds should be marked on the upper plan, and the side on which all the doors are hung, and on which they open, should also be indicated. The cardinal points, showing the aspect of the various rooms, must be marked on the ground plan.

7. The accommodation in each case is left principally to the judgment of the competitors, whose aim should be to produce the most complete arrangement that can be had for the cost, and that which is most generally useful in houses of the two descriptions specified. The usual reception-rooms, with library, kitchen, and offices, will of course be essential; more scope for thought and suggestion will be given if we abstain from offering a definite list of all the apartments required. It is to be understood, however, that the houses are to be

country or suburban ones, and that the kitchens are to be on the ground floor. The area is not limited, except by the cost and by the undesirableness of a too-straggling plan.

8. No condition is made as to style; but, as before stated, artistic character will be considered in deciding between designs otherwise nearly equal.

9. Competitors should send a short description, explaining the materials they intend to use, and, if necessary, noting any special features in the arrangement.

10. All designs received will be submitted to two professional referees, whose names we shall publish, and who, in conjunction with the Editor, will adjudicate the premiums. The Editor reserves the power of publishing in the BUILDING NEWS not only the selected designs, but any others which may possess sufficient interest; but all drawings, whether selected or not, will finally be returned to their authors.

THE FREE PUBLIC LIBRARY OF CINCINNATI, OHIO (U.S.).

THIS new building, of which we give interior and plans, is 80ft. in front on Vine-street, and extends 190ft. to College-street in the rear, covering the entire surface of the piece of ground upon which it stands. The front portion is finished and occupied temporarily for the purposes of the library, the rear building being in course of erection, and now ready to receive the roof. The front is four stories in height, built of a light-coloured sandstone, and is of massive design, surmounted by a cornice of galvanised iron, 80ft. above the pavement. Throughout the entire structure the construction is fire proof, rolled wrought iron beams forming the floors, with corrugated sheet iron arches between them, filled in with concrete. In the main library the columns supporting the ceiling are wrought iron of peculiar construction, ornamented with cast iron. The lintels are all of wrought iron, and the interior cornices, &c., of galvanised iron, the panels in the iron ceiling being filled with ornamental glass. Above this is an arched roof, studded throughout with prismatic lights of thick glass set in iron plates. The inside folding shutters for the windows are to be of wrought iron in moulded panels. In order to exclude the smoke and dust, the windows will be double, with French casements hung inside of the outer sashes. The main apartment is 80ft. by 108ft., and 50ft. high, surrounded by five tiers of alcoves (the lower ones are 11ft. high, but the upper alcoves are but 7ft. 6in.), with a capacity for 300,000 volumes. This room will be heated by hot-air chambers under the tiled floor. The gas burners above the ceiling will be lighted by electricity applied from the battery-room, located in the attic, the object being to avoid the combustion of gas in the room.

In the cellar are lofty vaulted rooms for the reception and unpacking of books, boiler-room, coal-vaults, &c. A steam-engine will be used for working an elevator.

The floors of entrance-hall, the visitors' reception-room, and main library, are to be paved with marble tiles of different colours. The staircases leading from the ground floor to the library, 7ft. above, will be of white marble; the remaining stairs throughout the building to be made of iron.

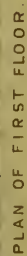
On the first floor, opposite the reading-room, is the delivery-room for the circulating library, which is immediately adjoining, but separated from, the library of reference.

The interior finish, wainscoting, &c., will be of black walnut, and the walls and ceilings are to be enriched by decorations in colour. Water-closets, lavatories, retiring-rooms, &c., have been provided for attendants and visitors. The plans throughout have been prepared by Mr. James W. McLaughlin, architect, and the work is now being done under his superintendence. The total estimated cost of the building (including the land) when completed will be 350,000 dols., or about £70,000.

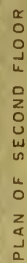
NEW VESTRY HALL FOR CAMBERWELL.—In this competition, twenty-four plans have been sent in, from which number "eight of the better ones have been eliminated and placed on the walls of the Vestry for inspection."

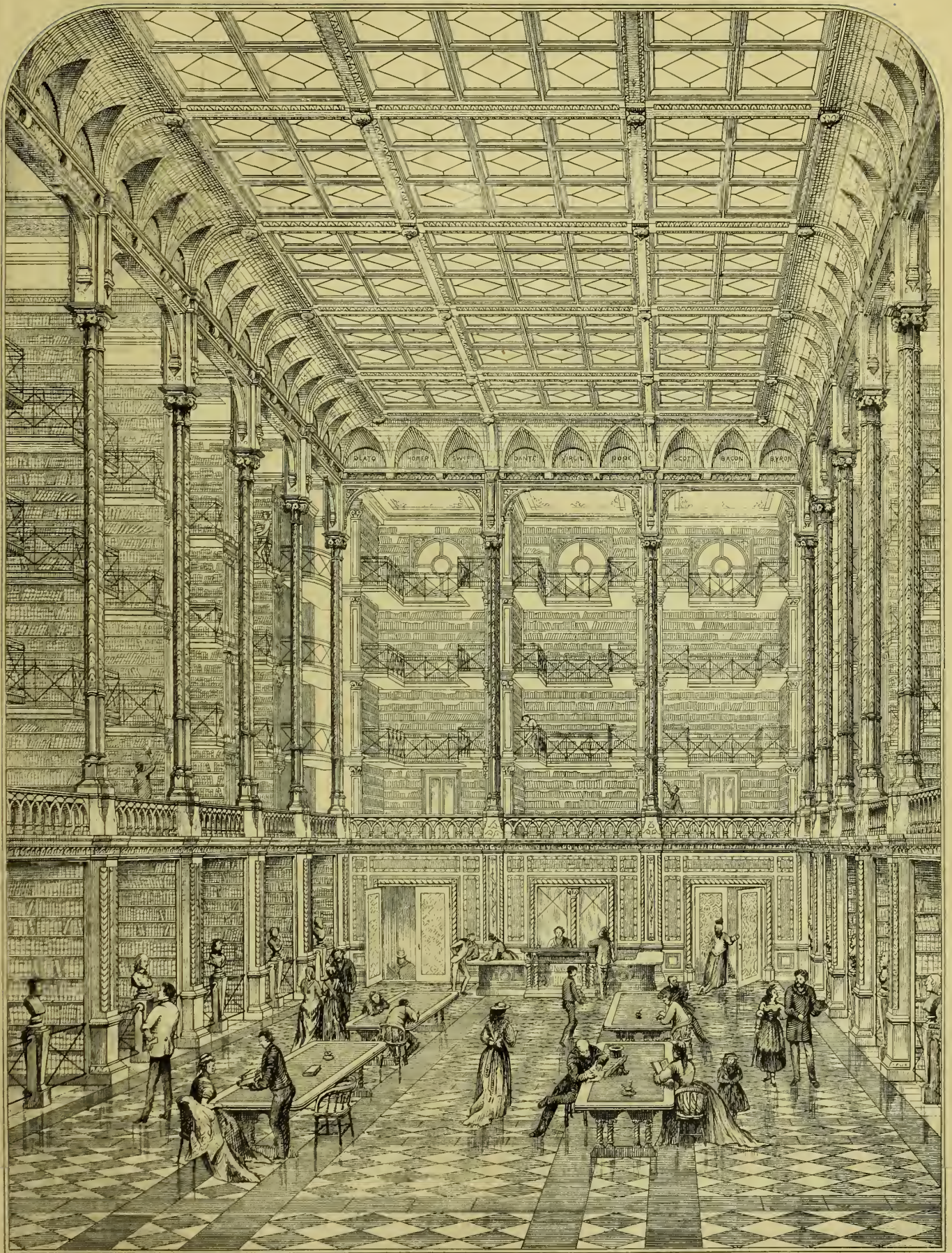
THE IRONMONGERS' COMPANY.—Mr. Richard Roberts was elected surveyor to this company on Friday last by a considerable majority. The other candidates who obtained votes were Mr. Payne and Mr. C. J. Shoppee.

* "Designs for Chimney-pieces," by GEORGE GORDON HOSKINS, F.R.L.B.A. Darlington: Published by the author.



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JAS. W. M^oLAUGHLIN, ARCHT

STREET ARCHITECTURE IN FRANCE AND ITALY.*

THIS work, of which the first part has just been issued to the subscribers, is both well conceived and executed. It is of a thoroughly practical nature, and not merely another in the series of picturesque miscellaneous sketches from abroad, to which we have become accustomed of late, and of which we confess to have had enough. Mr. Anderson has chosen a good subject—that of the domestic architecture of the Early Mediæval period in France and Italy—and proposes to treat it exhaustively. The several “valuable and useful volumes of Continental sketches” which have preceded this have been, as he states, almost exclusively devoted to ecclesiastical architecture, whereas his will be entirely secular. The author is correct in saying that no similar work has as yet appeared in England; and we have more than once expressed a hope in this journal that the void might be speedily filled. It is true that to a certain extent those familiar with the foreign publications of Viollet le Duc, Gailhabaud, and others, will at once recognise in Mr. Anderson's plates many an old friend; still, as he does not err in his remark that, with a few exceptions, none of the illustrations have ever been published in the same state of completeness before, we can only be thankful for the opportunity he has thus afforded for renewing and perfecting our acquaintance with them. The rapid transformation—as Mr. Anderson in his prospectus reminds us—that most of the old towns on the Continent are now undergoing does certainly render it most desirable that such a record of what yet remains of this class of buildings should be made. Those, for instance, in Cluny, according to our author, “are fast going to decay, every year seeing some of them disappear.” It is, therefore, high time that they should be thus, at least, preserved, as authentic examples of the work of Mediæval architects; and we are grateful to Mr. Anderson for having undertaken the task, and that in a manner so creditable as the instalment of his work that is before us promises for the rest.

The programme comprises drawings from the townhalls, shops and dwelling-houses, granaries and storehouses, of the middle ages, in the country lying between Normandy and the south of France, and from the north of Italy to the district around Rome; and some of the plates will be devoted to the details of the timber construction, brickwork, masonry, and ironwork, drawn to uniform scales.

The first division of the work, containing seventeen plates, just issued, has ten French and seven Italian examples. Of these the three first are from Cluny, near Maçon, in the Department of Saône-et-Loire. This town, which owes its origin to the Abbey of S. Benedict, still possesses, though in a sad state of dilapidation, many houses of the twelfth, thirteenth, and fourteenth centuries. A group of these houses—two of the twelfth and one of the fourteenth century—are given as they appear in the street, in juxtaposition, in Plate 1. No plan is given, because, as Mr. Anderson says, “they present no peculiarities of practical value in the construction of houses adapted to modern wants.” We confess we demur a little to this, and should have valued the plate more had plans of the two principal floors been added on a smaller scale, in the angles of the somewhat exuberant margin. The ground floor, we are told in the text which accompanies this plate, generally consists of a shop and staircase, with a small court-yard beyond the shop, and other apartments beyond that; and the upper floor has a large room to the front,

and others behind, corresponding to those below. The general features of these houses are tolerably well known to our readers: each is an oblong block of two stories roofed parallel to the street, the lower story having a simple large arched opening and smaller one to the staircase at the side, and the windows of the large room above are divided by columns bearing semicircular-arched or straight lintels, and grouped in one case in pairs on either side of a corbelled projecting chimney-stack, and in the others into a prominent central range, in the manner with which we are familiar in Venice. There is no attempt at continuity between the several houses; and in place of sills a moulded projecting string-course, under the bases of the columns, is carried to the full extent of each façade.

A beautiful fragment that remains of the once famous monastery of S. Benedict, facing one of the streets in Cluny, is given in the next two plates. This is of fourteenth century work, with a range of two-light traceried windows at the top, lighting a hall within. The detail is somewhat thin and wiry; but, as Mr. Anderson remarks, the treatment of the wall space below is clever.

Cordes, a town in Languedoc, is to furnish the material for nine plates, of which we have now only one, but a charming one (No. 19), detail of a group of windows from the house of the Chief Equerry. Until we have the other plates, it would be useless to dwell upon the architecture of this town, which seems to have been upon a larger scale, and more ornamental and higher-finished character than that generally of Cluny. We may notice, in passing, that in neither one nor the other is any trace to be found of that stern, massive—nay, even clumsy—character so often thought to be characteristic of Early French Mediæval work. On the contrary, every detail is highly-studied, well wrought, and delicately moulded, and the bearing-shafts are quite slender. Great effect, however, has been obtained by the judicious contrast of broad and plain wall space around these details, which are well concentrated and grouped.

From Figeac we have three plates, at present without any accompanying text. One of these (No. 20) has elevations of two good private houses of early date, one of which has the lower story apparently a simple store, with single archway of entrance at one side, and only two small slits as windows, and three pair of two-light windows to the main story above, evidently the residential part, and a half-timbered story over; while the other house has a range of arched openings to the street, and a beautiful group of couplets and triplets above, which must have given light to a noble apartment, reaching up to the roof. In considering the adaptation of such work to our climate, there would be a difficulty in preserving the same breadth and repose, since, in our gloomier country, the upper part of such a room would prove too dark, with its windows kept down so low.

The doorway from the house of Père Raline, given in Plate 21, and the windows given in Plate 22, are noble in scale and ambitious in treatment, but somewhat too liny and thin.

Clermont-Monferrand has contributed two elevations of houses, one round-arched and the other of fourteenth-century work, noticeable for the great variety—we should say, want of harmony—in the treatment of the openings in its three several stories. Another elevation is given from Saint Antonin, which shows how the same general character was handed down to the residences of a much later date, the doorway having a reversed ogree curve in its peculiar arched lintel, and the windows being transomed.

From France we are carried into Italy, to Siena, than which, says Mr. Anderson, few towns are so well worth a visit. It is almost entirely built of brick, and its streets are

still graced with the Mediæval palaces of the Siennese nobility, as well as the houses of humbler citizens, and all of them stamped with that strong individuality characteristic of this period.

Plate 52 gives, with all its details, the fine windows of three arched lights, and circle over, comprised under one pointed relieving arch, which in its general aspect is tolerably well known from previous illustrations in other works. We are glad to be able in this edition of it to examine the management of the jointing of the relieving arch, which is peculiar, in so far that extrados and intrados are not concentric, the arch being much deeper at the crown than at the springing. The voussoirs do not radiate from the centre of any of the curves, but from one much below, so that at the apex they are nearly perpendicular and not extravagantly tapered. Without such treatment pointed arches cannot be constructed entirely of brick, but would need keystones of masonry introduced.

Another plate from Siena, No. 53, of part of a range of houses and shop, shows as a top story a large open gallery called a *Salajo*, which is picturesque, and suited to a southern climate. In the school building in Bloomsbury, by Mr. Wild, this feature was imitated some years ago, but was found not so suitable for our metropolis, and has been glazed in subsequently, and its effect ruined. Over-ardent admirers of these illustrations by Mr. Anderson should take warning by this failure, and think twice before they import any of the novelties they may find therein. For our part we think the proportions of the bearing columns which separate the several lights of the windows would prove rather flimsy.

Cremona furnishes three plates to this part of the work. These are taken from the Palace of the Jurisconsults, which was originally a college for knights, dating from the year 1292. This, of course, is a well-known building, and does not appear for the first time in these pages. We welcome, however, the useful and careful drawing of it, which forms Plate No. 54, with the two sheets of enlarged details in the two succeeding plates. The large three-light windows: of its principal stage, with unpierced heads, are splendid features, and yet should be studied with care, and by no means copied, as there is some want of harmony between the slender bearing shafts and massive enclosing jambs and arches. The bold parapet and quaint turret at the angles, also, though eminently picturesque, are—and are likely to remain—as obsolete in fashion as in purpose. In this and other of the buildings we have mentioned the concentration of the ornament, and the reticence displayed in leaving many large spaces perfectly bare as a relief, are the secret of the success of their designers—a success of which this, their latest, and, we think, their most thorough elucidation, is a proof. Isolated examples have, indeed, been given, as in Gruner's fine work, even more elaborately, and with their colour—an important element in their composition; still, as a comparative series of fine and authentic examples, we do not think that Mr. Anderson has claimed too much in the prospectus from which we quoted in the commencement of this notice.

MODERN ENGLISH ARCHITECTURE.

MR. H. H. VALE, the President of the Liverpool Architectural Association, recently made the following observations on the duties and influence of English architects:—

The copyism of old mouldings, line for line, in modern work, must, I think, be considered unsatisfactory, the conditions under which we build being very different—for example, our reveals are much shallower, our openings larger, and our general treatment less massive and defensive in its character than the older work. Every true architect still loves a deep reveal, and a bold recession of mouldings—bead, hollow, fillet, repeating themselves in picturesque interchange of position,

* “Examples of the Municipal, Commercial, and Street Architecture of France and Italy, from the Twelfth to the Fifteenth Century.” Measured and Drawn by R. ANDERSON, Architect, Edinburgh. London, Edinburgh, and Glasgow: William Mackenzie.

while the play of light and shade varies and graduates at each remove into a perfect fascination of chiar'oscuro. The charm of our old buildings is, doubtless, centered mainly in these points of attraction; but while the architect admires, he must, as a matter of fact, regret that modern practice seldom or never furnishes such opportunities as the old master builders enjoyed. Nevertheless, great things are being attempted and done from day to day among us; exquisite bits of design meet us on every hand, labours of love that tell their tale to those who know something of difficulties overcome, of long and weary labours rewarded. We all, I think, agree that no true, honest painstaking work is ever thrown away, and that the architect who would live must be a hard and sincere worker—must go forward in a perfect chivalry of labour, bent upon conquest, bent upon that glorious result which will assuredly arrive if it be vigorously and manfully laboured for; therefore it is proper to this end that the works of the ancients should be used by us as spurs, but never as bridges. We must admire them, and use them, and go beyond them if possible, in the particular direction of our own age, otherwise they become to us nothing better than *dilettante* trifles, mere wonders of history, but not things upon which the deep foundations of fame can ever be laid. These remarks are not intended to apply to mouldings only, such as Mr. Sharpe has collected in overwhelming numbers, but to all the leading features of ancient architecture. I daresay it has often struck you how exceedingly evanescent and short-lived the mere revivals of style have been. Look at the Greek revival by Stuart and Revett, the Italian Renaissance of Elizabeth's reign, the Gothic of Rickman, and even of Pugin the elder, and "the line upon line" style of Street. How short a time modern architects care to be trammelled by an old set of ideas, taken from a given era of building; for how short a time will they be content to copy a fashion when they feel strong enough to create one! And must not this ever be so; are there not the daily requirements of the people among whom we live and work to be provided for in a practical way? We are asked day by day to give thought and care and labour to matters that never entered into the needs of other times, and it is the ability and vigour with which these things are accomplished that distinguishes the practical architect from the mere reproducer of other men's successes. We certainly live in an age of revivals—an age which is daily more curious to obtain extra data respecting earlier times; so "cave-hunting" and "Jerusalem excavations," "proposed dredging of the Tiber," the exploration of "mystic circles" and "lake dwellings" now enlist the enthusiasm of thousands of educated men and women, subjects which were considered only a few years ago too trifling for serious thought, and a mere waste of time. All the curious points of ancient architecture all over the world, from Ireland to Japan, are becoming well known to intelligent travellers. Photography also makes those who do not travel familiar with the great leading works of the ancients. All these influences must tend to throw the modern architect more and more upon his own resources, and therefore the knowledge of the people in matters architectural, whether derived from serious studies or fashionable pastimes, will give the greatest spur to progress, and insure the real producer of ideas the preference over the mere copyist of ancient productions. How often do we hear it said of modern Gothic work—"That is a little bit of Tintern," "that of Melrose," "this of York," "another of Lincoln;" but the spread of knowledge which is now progressing must, as it should do, put an end to such very unsatisfactory suggestions. A nation without a characteristic and strongly-marked style of architecture is not one of great interest to the student, and cannot co-exist with energy of character, or the spirit of political progress. How disagreeable it is to notice city views of Japan, with streets designed in unmistakable modern Italian architecture, or to observe at Constantinople the recently-erected palaces, designed entirely in the French taste, while both the Japanese and the Turks possess in their own architecture strongly-marked features and characteristics much more suited to the climate and habits of the people. I think one of the successful results in the treatment of modern buildings in our Indian Empire by English architects is the strongly-marked Indian character which they have impressed upon those structures. In designing churches for tropical climates the great shadow of the eaves, the provision for shade generally, and excellent ventilation, I have frequently admired in the drawings prepared by English architects for such climates. During a recent run through Holland, Belgium, and Germany, I was impressed with the growth of English ideas in their new Gothic buildings. As we belong to the great Teutonic family, it will not be derogatory either to us or to those

nations if there be from time to time an interchange of ideas in architecture. As I have said, all the best new work impressed me as having been suggested by recent English examples, and the elaboration of mere surface ornament, and lace-like decoration, seems to be giving place to the broader and more constructional treatment of form, and masses of light and shadow, as adopted in this country. In visiting the Cathedrals of Cologne and Antwerp, with all their fairy-like poetry of design, one feels a yearning for some plain solid wall to give relief and repose to the composition. At Mayence and along the banks of the Rhine, some of the old Romanesque towers and gables are full of valuable ideas and suggestions. In my opinion the cathedral at Mayence forms in itself a great study of composition and grouping, and if the dome is to become a feature in modern Gothic works, as many leading architects consider it should, the octagonal lantern or dome at Mayence might, I think, be studied with great advantage. The interior decorations seem to me to be in very good taste, and when the restorations now in progress are completed, this cathedral, with its double apsidal-end, will present a very impressive example of the early Romanesque architecture of the Rhine. I doubt not, under German rule, the Rhine will become more Teutonic than ever; that the poetical spirit will return to its banks, which so pre-eminently characterises the beautiful and picturesque groups that adorn this region of old romance. At Cologne and other foreign cathedrals I was led to speculate upon the specimens of stained glass, of recent manufacture, in the windows. The Munich glass is no longer being introduced into Cologne Cathedral; glass manufactured by local makers is now being used, and, in my opinion, with great advantage to the effect of the interior.

STRENGTH OF MATERIALS.

IN last week's BUILDING NEWS we gave an abstract of Mr. Carr's paper "On the Bridges of London," read at a recent meeting of the Institute of Architects. In the form of an appendix to his paper, Mr. Carr detailed a variety of experiments on the strength of materials made by Mr. Kirkaldy for the works of the new bridge at Blackfriars, some of which gave the following results:—

BRICKS, IN PIERS FOUR COURSES HIGH.

Description of Bricks.	Size of Pier in Bricks.	Mortar.	Falling slightly.	
			Tons per foot super.	Tons per foot super.
Common stock recessed.....	1½ × 1½	Lias lime	17	27
Common stock recessed.....	1½ × 1½	"	21	30
Red bricks, machine-made.....	1½ × 1½	"	20	40
Red bricks, hand-made.....	1½ × 1½	"	20	36
Galt.....	1½ × 1½	Roman cement	24	59
Clark's Sudbury machine.....	1 × 1	"	54	72
Uxbridge red, hand-made.....	1 × 1	Portland	49	76
		"	44	53

STONE CUBES OF TWO INCHES BEDDED ON SHEET LEAD.

Description.	Falling slightly.	
	Tons per foot super.	Tons per foot super.
De Lank granite, Cornish.....	283	363
De Lank granite, Cornish.....	279	—
De Lank granite, Cornish.....	349	377
Guernsey.....	276	830
".....	761	1150
Cheesewring, Cornish.....	295	403
".....	194	322
Portland.....	106	155

A small polished column of red Mull granite, length 6in., diameter nearly 3in., was cut through the middle, and the cut faces accurately ground; when tested, packings of pine were placed at each end, and the surfaces, where cut in two, were put together with a little boiled oil. This 3in. column bore a strain of 60 tons, or 8½ tons per square inch, 1260 tons per square foot, or the weight of a column 16,380ft. high.

An experiment was made to test the effect of a small area of iron pressing on a surface of De Lank granite. A cube of 1in. wrought iron was placed between two blocks of granite, 6in. × 6in. ×

5in. A packing of ½in. of pine was placed between the granite and the machine, and between the iron cube and granite. One of the blocks was split with a pressure of 50 tons. The block which was not injured was again submitted to pressure with another cube; it was then fractured with a pressure of 52 tons. The iron cubes were reduced in thickness one-sixth, with an equivalent lateral extension.

It was desired to see what would be the effect of great pressure on the skew-back stones. A stone was worked 1-4th scale, and a corresponding portion of arch-rib made. The two were bedded together with lead run in between, in the same manner as proposed for the arches themselves. They were then gradually submitted to a pressure of 200 tons, but without any effect except extrusion of the lead; the iron, however, with 18 tons per inch, seemed to have quite as much as it could carry. Being all to 1-4th scale, the area under pressure was 1-16th the real size; the pressure was, therefore, equivalent to 3,200 tons in the bridge itself, the actual pressure in work being under 400 tons.

Gun-metal cramps were also tested, the result being the rejection of several mixtures of metal submitted by the contractors, and an increase of strength obtained from 17,519lbs. per inch area to 28,883lbs. (from 7½ tons to nearly 13 tons).

In order to test the strength of timber used as struts, two whole balks, 20ft. in length and 13in. square, were submitted to end compression. The red timber crippled with 138 tons, or 112 tons per foot area, and the white with 147 tons, or 126 tons per foot area, the reduction in length being in the one case ½in. and in the other ¼in.

Portland cement was also tested, the standard of the Metropolitan Board of Works being adopted—110lbs. weight per bushel, and 500 tensile power on 2½in. area; some results obtained were as high as 733lbs. on the 2½in.

Experiments were made on the iron from time to time, but the specified strength was not fully attained; it was perhaps pitched rather too high for such work. The extension of one six-hundred-and-twenty-fifth part of the length was given by strains varying from 13 to 15 tons instead of 16 tons; but even with this, the elastic limit is just about four times the working load, which is ample allowance for safety, taking into account a very large deterioration for time and corrosion.

[All the figures in the foregoing are stated in round numbers.]

SOCIETY OF ANTIQUARIES OF SCOTLAND.

THE first meeting of the ninety-second session of this society was held in their library, Royal Institution, on Monday evening, Mr. Thomas B. Johnston, Vice-President, in the chair. The first communication read was a "Notice of Three Churches in North Uist, Benbecula, and Grimsay," by Captain F. W. L. Thomas, R.N., F.S.A., Scot., said to have been built in the fourteenth century. In this paper Captain Thomas gave detailed descriptions, illustrated by drawings and plans, of the only three of the ancient chapels in the outer Hebrides that have any traditionary date of their foundation, and which are stated by the historian of the Macdonalds, who wrote in the time of Charles II., to have been built by Amie MacRory, the repudiated wife of the "good" John of Islay, First Lord of the Isles. The first of these, Teampull na Trìnidad, or Church of the Trinity, stands at Carinish, North Uist, and is much dilapidated. A small chapel is attached to the main building by a very curious porch, the walls of which are not bonded into the church. The most remarkable feature of the church is that the west wall, which is built of undressed stones, without any attempt at horizontal coursing, has no windows, but is pierced with seven oiletts, three below and four above, averaging eight or ten inches square. A rounded window of undressed stones in the north east corner may be part of an original church built in the Norman style, while the south wall and the obtusely-pointed doorway may have been made at the time asserted by tradition, or before 1390. The second church described was Teampull Chalumchille, the Church of S. Columba, at Uachdar, Benbecula. This church, which has a narrow doorway in the west wall, so low that one must stoop considerably on entrance, inclined jambs, and small rectangular windows in the thick walls, presents a combination of antique features which Captain Thomas had not met with in any other church in the Long Island. The older part of this church, distinguished by the thickness of its walls and other unequivocal features of early construction, Captain Thomas was inclined to believe may possibly have been erected under the direction of S. Columba himself, but certainly prior to the Norse invasion in the

eighth century, while the thinner walls at the east end were probably repairs made by the Lady Amie about the end of the fourteenth century. Team-pull Mheacael, or S. Michael's, at the south-west extremity of Grimsay, North Uist, is stated by the historian of the Macdonalds to have been built by Amie MacRory, and to this date Captain Thomas was disposed to ascribe it, from the evidence of its architectural features.

THE INDIAN CIVIL ENGINEERING COLLEGE.

AN abstract of the "Syllabus of the Course of Study" at the Civil Engineering College, Cooper's Hill, may be of use to many.

The examinations are to be triennial, and the number of marks obtainable as shown in the following table:—

Branch	Min.	Max.	Optnl.	Total.
Engineering ...	64	174	80	254
Mathematics ...	18	72	60	132
Natural Science	10	30	30	60
Languages ...	8	24	30	54
	100	300	200	500

To qualify for the public service the student must obtain the minimum number fixed to each subject, but his gross total must reach at least 150 marks in all the subjects—those obtained under the head optional being reckoned in the aggregate. The final examination includes exercises in surveying, designing, and drawing, and in it the students will be divided into three classes in each of the four prescribed branches of study. Students placed in the first class, both in engineering and mathematics, will not be compelled to qualify in all the subjects. Engineering is subdivided into eight branches—viz., Descriptive engineering, to which 45 marks are assigned, 18 being the qualifying medium; surveying, with 30 marks, and 12 the minimum; architecture, 8 and 3 marks; geometrical drawing and estimating, 42 and 14 marks; accounts, 5 and 2 marks; free-hand drawing, 30 and 49 marks; notes and reports, 20 and 5 marks, and "project," 24 and 10 marks. The first six subjects are included in the work of the first and second year, the two remaining for the third term. The final test of the "project" is the requirement from the student of a scheme for a supposititious road, canal, or railway, with drawings, specifications, and estimates. In mathematics, pure and applied, the qualifying number of marks is 9, with 36 as the maximum. Natural science demands a minimum of 10, with a maximum of 30. A knowledge of Hindustani is compulsory, with the geography and history of the country, and for this 8 marks qualify and 24 may be obtained. Latin, Greek, German, and French may be studied; only two of them, however, to be taken up, at the will of the student. Less than six marks will not count, while 15 each may be obtained in the ancient languages and 10 each in the modern.

BOOKS RECEIVED.

Ganot's Physics. Translated by E. Atkinson, Ph.D. (London, Longmans.) The fifth edition of this well-known text-book appears with the advantages of better printing and paper, and a larger page. Twenty-eight new illustrations and a considerable quantity of new matter contribute to secure a repetition of the welcome given to former editions. *Practical Geometry*, by E. Wyndham Tarn (London, Lockwood & Co.) is published in the interests of practical men who, with but a moderate knowledge of geometry, may by a study of the work be enabled to apply the simple rules given for the delineation of various geometrical figures to many useful purposes. *Weale's Rudimentary Series*, Nos. 160 and 170 (London, Lockwood & Co.) No. 160 is a guide to Tasmania and New Zealand, by the Rev. James Baird, and is supplemental to the author's "Emigrant's Guide to Australia." No. 170 is "Mathematical Instruments," by Mr. J. F. Heather. Surveying and astronomical instruments are treated of in this division of the subject. *The Art of Garnishing Churches at Christmas and other Festivals*, by E. Y. Cox (London, Cox & Sons), has reached its third edition. We noticed this work favourably and at some length on its first publication, and need, therefore, now but mention that its interest and usefulness are enhanced by the addition of a number of fresh illustrations, the greater number executed in photo-lithography. *Patent Wrinkles*, by "Pyro" (London, Baillière, Tindall, & Co.), is a somewhat caustic review of the wrongs inflicted on inventors. The author has had his share of the vexations and difficulties he attempts

to combat, and his treatise may be useful as an additional incentive to the growing dissatisfaction with the present state of the Patent Laws, which must soon call for legislative amelioration. *The Sewage Question*, by J. Bailey Denton (London, E. & F. N. Spon), consists of letters reprinted from the *Times* and other journals, explaining the necessity of under-draining all irrigated lands, and the process of intermittent filtration (through natural soil), which has been carried out with success at Merthyr Tydfil, under the direction of the author. *What the People Say About the Children*, by Maria S. Rye (London, James Wade), will be read with interest by all interested in the good work Miss Rye has set herself so earnestly to perform. *A Handbook of the Principal Trade Societies of London*, by Robert Logsdon (London, the Labour Agency), is an alphabetical list of the London Trade Societies, giving their places of meeting, names of officers, benefits, &c. *The British Almanac and Companion for 1872* (London, Stationers' Company) differs very little from its predecessors. In its review of the year's architecture and public improvements it is down upon Mr. Street for his New Law Courts; the criticisms are of the same nature as those which have adorned the columns of the leading journal, and the writer seems to know nearly as much about the designs as the editor of the *Times*. Mr. Street has, it appears, been endeavouring to "achieve picturesqueness—a grave mistake, as the picturesque is never made, but is the result of time and accident, of growth and decay." The writer, however, has the common-sense to perceive the absurdity of attempting to set aside Mr. Street as architect, and, apparently in the hope that he may abandon the "picturesque," reminds him that Sir Christopher Wren had to amend his design for St. Paul's Cathedral, and Sir James Pennethorne, had to prepare three designs for the London University, "and at last succeeded in pleasing almost everybody." Far more fortunate was he, if this last sentence is true, than Mr. Street is likely to be, or, in our opinion, than any other member of a profession so distinguished for its *esprit de corps*, its unanimity of taste, and its disposition to admire with a delightful singleness of heart the productions of the more illustrious in its ranks.

OXFORD ARCHITECTURAL AND HISTORICAL SOCIETY.

THE third and last walk this term took place on the 2nd inst, when Exeter College and the Divinity School were visited. The members and their friends were welcomed by Dr. Lightfoot, the Rector, who expressed his regret at the absence, through indisposition, of Mr. James Parker, on whom, he said, he had relied for giving them some information respecting the college. The rector then gave a brief description of the college, observing that the oldest portion of it now remaining, of which they had certain information, was built in 1432. The college underwent thorough repair in the last century, and a portion of very ancient date had been taken down, of which scarcely any trace could now be seen. The tower which stood at the east end of the chapel was built in 1432 by a precentor of Crediton, which was his native town. The Hall was built in 1618. There was a large collection of money made in the previous century. The money was collected for a certain cellar, but whether that cellar stood upon the place where the Hall was built was unknown. The Hall was a very good specimen of architecture of the period in which it was built. The old Chapel was erected about the same time as the Hall, or at all events within a few years afterwards. The then Sir John Acland gave £800 towards the building of the Hall, and a further sum was given towards the same object by the College. In 1811 the Hall was repaired, and it now possessed a roof of an admirable character. The late Baronet, Sir Thomas Acland, father of the eminent physician, gave the large window on the north side at the east end. There was a curious crypt under the Hall, but whether that was of greater antiquity than the hall itself he could not say, and he was sorry Mr. Parker was not present to give them some information respecting it. He thought it must have been built in the previous century, if not at an earlier period. The Rector then remarked that as the weather was cold he would give them some information about the College before they left the Hall, instead of detaining them in the cold while viewing the other portions of the buildings. Speaking next of the chapels of the College, he observed that one was built by the founder, but whether that one stood in the place now occupied by the library was not quite certain, but there was a chapel there of great antiquity, and probably from near the foundation of the College, if not coeval with it. Hearne says, "The Library was formerly the

Chapel, and so continued till 1625." They possessed the Bursary accounts of the College from the first decade of its foundation. There was nothing, however, to show whether the Founder's Chapel stood on the site of the present Library or not, but he was of opinion that it did, and that it remained until the beginning of the last century, when it was almost destroyed by fire. The chapel previous to the present one was an admirable specimen of Perpendicular architecture, but unsuitable to the requirements of the College, and moreover it was pronounced to be in a dangerous state by the architect who examined it. Consequently it was taken down, but the defects which were so strongly spoken of were found not to be so much in the walls as in the roof, which was in the last state of decay. The roof was of a peculiar kind, and similar to that of a great number of churches in Devonshire. It was plastered on the inside, and nothing could be worse than preventing air getting to the woodwork. The old chapel was from 1625 used as a library until the last century, when a new library was built on the site of the present library. The rector then alluded to the financial resources of the College, and stated, as a gratifying fact, and as showing their interest in the College, that some of its servants had contributed large sums towards it, among them being a cook and butler, and he himself had enjoyed for twenty years the advantages of a benefaction made by a steward of the College. A room over the old Library, for example, was built by a cook for a student, and it appeared that in very old times persons built a room here and a room there for students, according to their fancy, and he had no doubt that at one time the ground now occupied by that College had ten or twenty cottages or houses built on it. The tower, towards the Turl, he observed, was of recent date. All the other portions of the College now remaining, except those built in the present century, were erected in little less than one century, from 1616 to 1700. The first building erected was at the east side of the quadrangle in 1616, and the next were those adjoining Turl-street. Archbishop Marsh gave £1,000 towards erecting the eastern range of buildings, and those which compose the quadrangle, although not differing much in architectural style, were erected at seven different times. The whole College at one time had dormer windows, and he expressed a hope that these would some day be restored; the battlements were all, he believed, of more recent origin. The rector produced the elevation of some proposed buildings for the college in 1708, and said he thought that they might congratulate themselves that the architect was not selected to carry out his design. A picture of the old modern buildings which used to grace Broad-street was also produced. They were usually occupied by German students, and a portion of them was re-erected in the Turl. As to college plate, very little of ancient date was possessed by the College; nearly the whole of it was given up to King Charles in the civil war. They were a very loyal body, but, loyal as they were, the plate was given up very unwillingly, as the original documents showed. At the time they were promised its worth, but they had never, he need scarcely say, received a penny. All the plate they now possessed of any interest was what they saw before them. As to one of the pieces they knew nothing of the donor or of any certainty as to date. It was sent to Kensington, where it was greatly admired. An antiquarian who had seen it said that he had no doubt it was of a date prior to Elizabeth's time. One of the other pieces, a gold cup with a cover, was given by the Bishop of Chester in 1688, and the other was a specimen of no great rarity. With regard to the money expended on the College at different times, he would not detain them by giving any account, but within the last twenty years no less than £50,000 had been spent on it. This spoke well for the attachment of its members. Something like £16,000 was raised by subscriptions towards the chapel, and either for its erection or for that of the other buildings of the College, no debt now remained.

The Rev. C. W. BOASE pointed out that Exeter College at one time consisted of several Halls, and dated from 1314, which was also the date of the battle of Bannockburn. In the same manner as Worcester College had absorbed her Halls, so Exeter had absorbed hers. He explained that at one time a narrow lane ran through the College, and mentioned a peculiar coincidence that occurred just previous to the destruction of the Library by fire. Hearne, the Librarian of the Bodleian, had a dream that there was a fire, and that he was in the midst of it. When he awoke in the morning, he went to see if the Bodleian was on fire. That Library was not, but the Library of Exeter College was. They had now in their possession some of the books

* Syllabus of the Course of Study. London: Allen & Co.

which were in the Library at the time, damaged by the fire. They had a great curiosity in their present Library. It was that of a Psalter of Henry VII.'s reign, which belonged to Elizabeth of York, who had caused to be entered in it not only the names of her children, but also a record of the battle of Bosworth. The company then left the Hall and inspected the crypt underneath. It is known as the crypt of S. Mildred.

The company next visited the Chapel, where all the objects of interest were pointed out by the Rev. W. Ince, Sub-Rector. The beautifully stained-glass windows were particularly admired, and the brass eagle used as a reading-desk, and presented by the Rev. John Vivian, B.D., in 1673, also attracted much attention.

The company were next conducted to the Library, where some time was spent in looking at the interesting Psalter alluded to by Mr. Boase. Before leaving the Library the Rev. J. S. Treacher, one of the Hon. Secs. of the society, proposed a vote of thanks to the Rector, Sub-Rector, and Mr. Boase, for so kindly receiving them that day. It was carried with acclamation, and the company left the College, passing through the hall of the Rector's house, the Rector pointing out a portion of it to be the work of 1432.

The Divinity school was then visited, and Mr. J. P. Earwaker, of Merton College, the other Hon. Sec., in the absence of Mr. James Parker, gave an outline of the history of the latter building. He stated that previous to the fifteenth century the Divinity exercises were read in various of the Benedictine chapels and in the University church. In 1426 or 1427 the University obtained from the masters and scholars of Balliol a vacant piece of ground, in exchange for Sparrow Hall, and began this building in which they were assembled. Contributions rapidly flowed in from many of the prelates and the deans and chapters of most of the cathedrals. In 1445, Humphrey, Duke of Gloucester, suggested the building of a public library over this room, and contributed largely towards it. The other principal contributors were Thomas Kemp, the Bishop of London, and his uncle, the Archbishop of York, whose coats of arms were to be seen in the roof. The erection of the building was superintended by Elias Holcot, Warden of Merton, who was physician to Humphrey, Duke of Gloucester. Mr. Earwaker observed that probably most of those present were acquainted with the story of the skilled workmen employed on it being drafted off to Eton and Windsor, under the direction of William of Waynflete, the founder of Magdalen College. Feeling the loss of those men, the University petitioned for them to be restored, and the building was completed in 1480. They could scarcely form any idea of the magnificence of the building at that time, when the fine windows were filled in with glass of all colours, representing the Saints and Fathers of the Church, and the roof shiing with the arms of the benefactors. The pendants from the roof were, as they saw, beautifully sculptured. He next adverted to the dispute that took place in that building, in 1540, between Peter Martyr, a great and eminent divine among the Protestants, and the Canon of Christ Church, a Roman Catholic, respecting the presence of Christ in the Sacrament. In the reign of Edward VI., and after the Reformation, the building was greatly neglected, and Anthony Wood states how the windows were broken, part of the furniture removed, lead stolen, and the brambles and bushes grew about the walls, and that there was a shed for cattle erected near it. In the reign of Queen Mary, the building was restored, but in the following century it again sunk into neglect. In 1625, after the death of King James, Charles, on account of the plague that was raging in London, held his first Parliament at Oxford. The House of Commons assembled in this building, the House of Lords in the north end of the Picture Gallery, whilst the Privy Council met at Christ Church. Respecting the assembling of the House of Commons in the Divinity School, Wood very quaintly says, "It is observed by some that this giving up of the Divinity School unto the use of the House of Commons, and placing the Speaker near the Professor's Chair, did first put them into a conceit that the determining of all points and controversies in Divinity did belong to them, for after this we find no Parliament without a Committee of Religion but what did think itself sufficiently instructed to manage the greatest controversies of Divinity which were brought before them, and with what success to religion we have seen too clearly." Mr. Earwaker then went on to state what alterations were made in the school in 1669, and that, in 1701, it was restored to its present state under the superintendence of Sir C. Wren.

After some little time had been spent in looking at the building, the company separated.

Building Intelligence.

CHURCHES AND CHAPELS.

GLASGOW.—At a public meeting of the Free Church denomination recently held in Glasgow it was resolved to endeavour to build twenty additional churches.

NEWINGTON.—The Metropolitan Board of Works have purchased for £5,000 the church of S. Mary, Newington, which has long stood in the way of local improvements. It is proposed to erect a new parish church (on a site given by the Ecclesiastical Commissioners) a little further to the south—viz., in the Kennington Park-road, at a cost of £10,000, and, with the purchase-money of the old church, more than £7,000 is in hand. It is also proposed to erect a new mission church, in the rear of the churchyard, at an additional cost of £4,000.

S. CLEMENT DANES CHURCH.—The lighting arrangements of this church have lately been considerably improved. The three old sun burners, which were suspended at too great a height, have been removed, and their place supplied by two 20 point stars and three 10-point ditto. By this new arrangement about 400ft. of gas is saved per hour, and the light given is quite 40 per cent. in excess of that previously given. The work has been done by Messrs. Evered & Co., of Drury-lane and Birmingham.

BUILDINGS.

LONDON.—A new bank is being erected for the Clerkenwell and Smithfield branch of the London Joint Stock Bank. The building occupies the angle of S. John-street and Charterhouse-street, and is from the design of Mr. L. H. Isaacs. On either side of the entrance doorway are polished columns of Aberdeen granite. These carry a circular projecting oriel window, running up to the top of the second floor, where it falls into the line of front, having on the one pair two mullions, fluted pilasters with carved caps, a balustrade at the two-pair level, and enriched carved architraves to the two-pair windows; above, the front at the tangent line rises with a circular pediment, and carving on the tympanum; a chimney stack, in Portland stone, completes the elevation. Along the line of the ground-floor detached columns in Portland stone, alternating with square pilasters fluted in panels, carry the fascia. The ground-floor is occupied by the bank office, waiting and manager's rooms; and a portion of the building will be let as a district post-office. The ground and first-floor are fire-proof, Dennett's patent. Messrs. Browne & Robinson, of Worship-street, are the builders.

NORWICH.—A new block of buildings in the Market-place, Norwich, is approaching completion. The premises consist of an inn and shops, and are Classic in style. Mr. John Bunn, of Norwich, is the architect, and Messrs. Newman & Harrison the contractors.

STATUES, MEMORIALS, &c.

STATUE TO THE LATE LORD HOLLAND.—Preparations are nearly completed for the erection of a bronze statue to the late Lord Holland, the joint work of Messrs. G. F. Watts & Boehm. It is to stand in the centre of the south side of Holland Park, Kensington, and a part of the wall of the park, outside the footway of the Kensington-road, has been removed for the purpose.

BUST OF LORD DALHOUSIE.—Mr. Hutchison, R.S.A., is at present engaged on a bust of Lord Dalhousie, commissioned by the Grand Lodge of Scotland, and intended to be placed in the Edinburgh Masonic Hall.

MEMORIAL OF THE LATE REV. DR. GLOVER.—Mr. John Hutchison, R.S.A., has just completed for the congregation of Greenside Church a memorial of their late pastor, Dr. Glover. The leading feature of the monument, which is a mural one, is an oval medallion in white marble, enclosing a head of the late divine, sculptured in high relief. The medallion rests on a white marble plinth, and that again on a broad slab of the same material, which is supported by two corbels. The difficulty in composition involved in the placing of an oval in juxtaposition with a flat surface is got over by the introduction of two palm branches. A background of Pyrenean marble of a pleasing gray colour forms a setting for the work.

CHIPS.

Mr. J. T. Newman, of Fenchurch-street, has been appointed architect to the West Ham School Board.

A new hospital for contagious diseases is to be erected at Yarmouth, from plans by the borough surveyor. The cost will be about £500.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

RECEIVED.—J. H.—J. J.—C. L. E.—R. N.

J. COTTON.—With view of church.

E. P.—All the numbers containing last series of articles on "Furniture and Decoration" are in type.

TYRO, AND "ONE WHO HAS SUFFERED."—In all probability the articles referred to will be reprinted in a handy form.

W. G. E.—We shall be glad to hear from you at any time.

W. H. J.—Suspended.

Correspondence.

NEW COURTS OF JUSTICE.

To the Editor of the BUILDING NEWS

The President of the Royal Institute of British Architects presents his compliments to the Editor of the BUILDING NEWS, and begs to state that he has received a note from G. E. Street, R.A., informing him that if any members of the Royal Institute of British Architects would wish to see the drawings for the proposed New Law Courts, Mr. Street will be happy to make arrangements for their doing so on Saturday, Dec. 23rd, at three o'clock in the afternoon, at the architect's office on the site, the entrance to which is by a small door in the hoarding in Carey-street. Any architect presenting his card at that entrance will be permitted to see the drawings.

9, Conduit-street, Dec. 13th.

SIR,—In the interests of justice and fair play, I would venture to reply to "H.'s" letter in your last journal. We Englishmen enjoy the choice privilege of a great freedom of speech upon all subjects, it matters not what they be; but by no means does it follow as an inference that everything said in our free-speaking country is either strictly true or impartially honest.

Your correspondent's letter is a fair specimen of the weak arguments which have, up to the present time, been brought against the work of the chosen Government architect. By one critic he is accused of ruining the elevation by variety of design and outline; while your correspondent "H." complains that "only small portions of the front can be seen at once," and consequently "that the architecture is not suited to a narrow street at all." Now, it would appear to me, sir, that these two valuable criticisms completely militate against each other; for is it not better in a large building which is principally seen piecemeal as one walks along the street to observe a pleasing variety in the architecture rather than one monotony of detail?—the case with so many of our public buildings, and which may even be urged in a degree as a fault in our great Parliament House itself. Looking at the matter in a common-sense point of view, a little variety, under such circumstances, cannot be a grave error for Mr. Street to have committed, but rather the reverse; and we have good precedent for believing that the genius which pervades work executed by this architect will also infuse itself into the detail and general features of this building.

"H.'s" letter is, however, too commonplace in its tone to need further comment, with the exception of one paragraph, which is so dishonestly untrue that I have minded to take up my pen for the sole sake of refuting it. The paragraph I allude to reads thus, and occurs about the end of the letter, "Let me ask you to inquire of every architect in the country his opinions of these designs, and I would venture to say that ninety-nine per cent. would use language not a whit less condemnatory." For the honour of our profession I most unhesitatingly deny that "ninety-nine per cent." of provincial architects devalue their good taste by privately or publicly endorsing this or any other of the remarks propounded by your correspondent.

I will, however, venture to remark about our profession that there are few men in it who are capable of fully conceiving the effect of a building from small mechanical drawings; let those, therefore, that

cannot (*e.g.*, your correspondent "H.") hold their peace upon the merits of the design, and not talk such rubbish until they are asked for an opinion; let them, I would add, rely rather on the almost unequalled precedents of work by the author of this design for its success in execution.

Lastly, the whole gist of the movement in my humble opinion is this: Mr. Street is a man who does not exactly make himself popular in the profession (I, myself, owe him a grudge about a matter of business), and hence arises all the hue and outcry which, by some individuals, have been raised against his designs for the Law Courts. For the honour only of our profession, I trust there will be no miscarriage of justice by placing the work in other hands. Enclosed is my card.—I am, &c.,

A PROVINCIAL ARCHITECT.

Essex, Dec. 9, 1871.

THE POSITION OF THE ARCHITECT.

SIR,—May I ask a little space in your paper to consider the position an architect holds in this country?

It needs, alas! but a short time in the profession to convince any of us that that position is held very cheaply by the public. Long before Mr. Ayrton had frowned upon us, people had taken our measure pretty accurately, and set us down certainly no higher than the builder, and very much beneath the engineer. A friend of mine on asking, not long since, whose a certain church he pointed out was, had the builder's name given him; and this is no very uncommon occurrence. The question, therefore, I have asked myself is: Why are we thus slighted and ignored? The common answer is, "There are too many of us," and that to get a living many are compelled to tout and advertise for practice. Now it is quite true that there are too many of us (no wonder, when any one can call himself an architect); but that alone will not account for the coolness of the public towards us. We must look deeper for the reasons, and these are, I think, to be found—first, in the indifference of the masses to fine art, and especially architecture; second, in architects themselves preferring to design "pretty" buildings to making them useful; in other words, studying their own wishes rather than their clients' interests; and third, in the long bill of extras that usually accompanies the final settling of accounts for any works.

I will take these reasons in their proper order, and consider first the indifference of the mass of Englishmen to the fine arts. Of course I do not include in the term "the mass of Englishmen" that small minority of the upper classes who appreciate good architecture and good painting when they see them; it is the large middle class to whom I refer. In proof of the indifference I have spoken of, just cast your eyes backwards a few years to that utter failure, the Architectural Exhibition. With the exception of the opening meetings, there were rarely half a dozen persons in the rooms at a time, and these few professional men. What a depressing effect it had upon the spirits to hear one's almost solitary footfall in the rooms as he glanced at the drawings, catalogue in hand; what a "got-no-work-to-do" look the miserable attendant had! If we turn to the Royal Academy Exhibitions, who but professional men and their relations ever look at the architectural part of it? I quite admit no mere architectural drawing can hope to compete with the beautiful paintings in other parts of the building, but I maintain there is not even a parting glance bestowed upon "our" work. If looked at at all, it is the "colourist" who takes the little favour the public have to bestow. Of what use is it to fret and fume because the hanging committee consign our productions to some side room or passage, when we are too painfully conscious that nine men out of ten will endorse their action? Again, in the House of Commons, how jealously every vote for public works is scanned. Not alone by the present Government are they reduced to the lowest possible figure, but past Governments have preceded them to some extent in the same course, although their Chief Commissioners of Works have shown themselves less off-hand and sarcastic than the present holder of the office. Still, I am inclined to think that they correctly interpret public opinion. National buildings are very uninteresting, as buildings, to the greater number of us. They are visited as a matter of course, because we like to say we have seen them; but if we begin to criticise, ten to one it is the size of them, not their intrinsic merit, that strikes us. Nor do I think that the love of church restoration, just now so common, can be urged against what I have said. A revival of religious feeling has quite as much or more to do with these restorations as the love of restoration for itself.

My second reason for our being so lightly esteemed lies with ourselves, and it is well to look the matter in the face. How many of us think infinitely more of designing a pretty building to making it suitable and useful? This is the charge so often laid at our doors, and so frequently true. Take the case of many of our suburban villas, often badly planned and arranged, with lots of fussy little contrivances of no value whatever, absorbing, with the outside ornament, the money that should be spent in making larger rooms and in better work. I have visited some of these abodes of bliss, and more uncomfortable places I never entered. I candidly admit that many a builder's house, where no architect has been employed, has pleased me better. I think, too, we architects are ignorant of, or indifferent to, our national characteristic, "utility." Why shut our eyes to the fact that the public don't, as a body, care for the artistic part of their houses? If they employ us at all, it is to save their pockets and give them useful buildings, not for us to design them a handsome façade. Build them a house, and which will you hear most of, the handsome façade or a "smoky chimney" if there should happen to be one? Comfort, and not art, is their first consideration in a house; and we should do well to lay this to heart. Some of the best planned houses I have known have been by men who were never brought up as architects at all, but who chose to call themselves so. With them, in most cases, utility was everything, and the result was their clients were satisfied. I make no defence of their architecture—it was bad enough in all conscience—but this was a secondary consideration with their employers. These self-styled architects have another point in their favour—as a rule, they have few extras; and this brings me to my third reason.

Who does not remember the long face his client has pulled at the bill of extras presented to him at the final settlement of accounts? He has been deluding himself all along with the idea that the contract price is all he had to make provision for, and is sorely perplexed with this supplementary estimate. In many cases these extras occasion serious inconvenience to the client, and some reproaches to the architect. Not that the fault is always on the side of the latter. Quite as often the client has only himself to blame, since by altering the plans, &c., after they have been signed the extra expense has been incurred. Still the fact remains that very few buildings are completed without some extras of the architect's own ordering, and generally due to his own want of forethought or incomplete specification. Most of us make some provision for unforeseen contingencies; but from the desire to keep the original estimate as low as possible, that provision is rarely enough. I don't exaggerate the importance of this point. I have heard it said over and over again by persons intending to build, "I don't employ an architect because I am afraid of the extras." They prefer to employ a builder, who engages to do their work for a lump sum.

I fear, sir, I have trespassed too largely upon your space, and that my indictment of architects may seem somewhat severe. We are not answerable for the public want of taste for architecture, but we are for the want of confidence in us as regards studying their wishes and pockets. There are some few in the profession who have such undoubted talent that my remarks as to the general indifference to *their* work will not apply; and there are, of course, some such good men of business who are so careful of their clients' interests that to them the charge of badly-planned houses and long bills of extras would be unjust. It is for the majority of us to take care that there shall be no ground in future for these latter charges being made against us. If we set our houses in order in this respect, I think we may expect some return of confidence in us, and not subject ourselves to invitation to compete for churches, &c., where "no plans will necessarily be accepted," and where the committee are so sure of getting some plans that they won't offer even a premium.—I am, &c.,

CRITIC.

NEW BUILDING ACT.

SIR,—I observe in the papers that a new Building Act is to be brought forward in the next Session. Probably it will be the same as that prepared by Sir Wm. Tite, Mr. Bentinck, and Mr. Bowring in the spring of 1870. I have a copy of that bill now before me. It is a consolidation bill, and numbers seventy pages. There is not a great deal that is new in it, but as a consolidation of building and management Acts it is to be welcomed.

Under the head of "Light and Ventilation" it provides that buildings may, under conditions, be brought forward to any extent, provided they do not extend beyond a line at 45 degrees with the front

boundary of the adjoining building. The word horizontally should be inserted to the 45 degrees, or there would be an obscurity here.

In any new Act I think it would be a fine opportunity to make some provision about ancient lights, and the most equitable way to settle that question would be to draw a great distinction between buildings in the suburbs or almost rural parts, and those in the City. When Sir Wm. Tite & Co. built the East India Chambers, a person on the opposite side the way (40ft. across) actually brought an action to prevent the new chambers being carried, perhaps, some 10ft. higher than the old squat building they replaced. Now the new chambers are not of unusual height, and it appears to me such an instance of straining for ancient lights should not be allowed. Had Leadenhall-street been only 15ft. or 18ft. wide, like so many City lanes, the claim would have been fair and reasonable. Within the City of London it would simplify matters very much if no claim for ancient light were allowed where a line of 45 degrees upwards could be drawn free of obstruction from the sill of the lowest window. On the other hand, let no new building in a narrow lane be allowed to be carried up to a height as is now done every day of perhaps 60ft. in a street not wider than many a gentleman's dining-room.

I observe a wholesome restriction which limits the height of new houses to 60ft. from ground to eaves where the street is under 40ft. wide, and I submit that it might safely be further lessened. There is very little use or money return for the top floors of excessively lofty houses—every man of business knows that in the City and West End the chief rent is from the ground floor and the first floor; the second floor falls off very much, the third floor still more so, and the fourth floor is almost valueless, except for housekeeper or store rooms. Now a house of this number of floors above ground would generally be rather less than 60ft., or if the top floor were attics, about 50ft. to the coping of parapet. Where a street is of the width of Portland-place or Queen Victoria-street, the height of houses in it is not very material. With old streets less than 25ft. wide, of which there are scores in the City, some special and careful legislation would seem advisable on the ground of light, air, health, and the risk of fires spreading.—I am, &c.,

H. Y. P.

INCORPORATION OF ANCIENT MASONRY IN NEW BUILDINGS.

SIR,—Allow me to draw attention to this common mistake, made in some cases, no doubt, with a view to preservation, but in almost all instances much better avoided. An illustration in my own neighbourhood will serve as an example of the mischief sometimes done. Coomb, or Combe Abbey, one of the seats of the Earl of Craven, formerly a house of the Cistercians, converted into a mansion by Lord Harrington, and where the Princess Elizabeth, daughter of James I., was at one time a temporary resident, previous to her marriage with the Elector Palatine of Bohemia, has been subjected to the process I complain of. It has been determined by its possessor to rebuild this mansion, and in so doing to incorporate with it the old Norman arcade in the eastern cloister, which appears to have been the entrance to the chapter-house: the mouldings, pillars, and arches have been scraped and tooled, new pieces inserted, and all traces of their antiquity irretrievably gone. How much better would it have been to have removed all that was comparatively modern, leaving the fragments of the original abbey standing, placing the new buildings at a little distance on a better site, and allowing the remains of the abbey to become (which it would have done in due course of time) a picturesque ruin in the grounds. This arrangement would have served a good archaeological purpose, besides adding a feature to Combe which it does not now possess. Amalgamated as they are with the new works, their identity and association with their original purpose are entirely lost, and only those who knew the fragments could pick them out from among the renewed portions. An equally objectionable case of mutilation came under my observation a short time ago; in this instance in connection with an ecclesiastical building. The parish church of Armitage, in Staffordshire, has been recently rebuilt. Here was a fine Norman south doorway, the ornaments of which were extremely grotesque and singular. Instead of retaining the old doorway as such, they have imitated it, and some of the stones belonging to it have been stuck into an iron framework as a churchyard cross; the swelling of the metal by corrosion has done more damage to the carved work in a year or two than the weather and neglect in their old position did in six or seven centuries, and when I saw them they had all toppled over together,

and were split in all directions. I am of opinion that the interests of architecture and archaeology would have been better served by the reconstruction of the original arch, even though defaced, than the reproduction of the old in a new material. The desirability for church restoration is great, I admit, but the mischief attending it, through the ignorance of builders and architects, is sometimes irreparable.—I am, &c., VIATOR.

SCHOOL PLANS.

SIR,—On reading the letter of "An Architect" in your last week's number, the thought arose in my mind that the interests of school building and the efficiency of such erections for the purposes for which they are intended would not suffer if schoolmasters themselves were a little more consulted than they are. And this should be specially borne in mind just now, when we are likely to require a large accession in the number of school-rooms. The matter of arrangement is generally settled between the architect and the trustees or committee, aided largely, no doubt, at times, by some such a "practical man" as your leader ably describes, and between them a group of school buildings is often a complete muddle, requiring expensive subsequent alterations to render them suitable to their purpose. Of course, an architect's reputation is partly dependent on presenting a pleasing elevation. This may be safely entrusted to him, but the efficient working of the school depends greatly on its arrangement and fittings, and in this matter I contend the teacher's opinion might, with advantage, be sought.

In the town wherein I reside we have a number of schools, but (judged from the standard of fitness for their purpose) scarcely a good one among them. Some are entirely wanting in class-rooms, others have only brick floors, while badly-arranged windows and imperfect warming and ventilation are common. Two of them have been sacrificed (so far as to their utility as schools) by attaching chapels of ease to them, the schools, which were nominally the primary objects of the building, being really the secondary ones. Perhaps the suggestion I have thrown out may in some quarters be not deemed unimportant.—I am, &c., VERITAS.

[School-planning is most important at the present time, and we should be glad to hear opinions and suggestions from correspondents upon the subject.—ED.]

NEW LAW COURTS.

SIR,—After long waiting and great expectations by the public, a contemporary of yours has at last discovered a gentleman who comes forward as champion of Mr. Street's latest designs for the Law Courts, and it is fortunate that it is so, because the public are thereby made acquainted with the reasons adduced for the designs being carried into execution. I look upon the articles which you published while the designs were carefully kept secret more to show an anxiety to see the matter settled once for all, than that the designs are by any means the very best which the country can produce. I apprehend, however, that the tenor and fulsomeness of these comments will defeat the object you had in view rather than inspire confidence and approval in the minds of professional gentlemen or the public to the extent as appears to have had possession of the writer thereof. There is a marked difference between the articles you have lately published, and your really masterly criticisms of the original competition designs, which few of your readers will fail to notice. That a change should have crept over the spirit of the dream during the last five years is quite natural, for you are not alone in an anxious desire to see some definite settlement arrived at. But as these buildings are intended to last for ages, the profession and the public would rather wait twice five years than perpetuate to generations unborn the most important and frequented building in the country, which might be unworthy its object or the period of history that gave it birth.

By the champion referred to the adverse critics are termed "clamourers." This is true only so long as we read it in the light of calling for better designs and nobler architecture than Mr. Street has yet shadowed forth, but in the manner advanced by the person referred to it is simply a false representation of their motive. So far as I am able to judge, there is no desire in the profession for the removal of Mr. Street—on the contrary; but we do want him to give us something better than he has done. These buildings are so important, and so much expectation has been raised thereon, that their final result will advance or retard the position of the profession a generation. If criticism on these works is to be stifled simply at the dictate of a President of the Institute, or because it may be distasteful to a few, we might as well surrender at once all liberty of opinion, conviction, and expression, in which case the profession at large would very soon come to the dogs. Free and purely-intentioned criticism is the healthiest and most effective prompter which we possess.

We will pass over the very laboursome attempts to invent phrases to justify the designs, because the concluding paragraph is the key and essence of all his

previous arguments. "It is only by the actual courts of law that we are at all impressed; and it is, therefore, to them alone that we should look for effect. I am glad," he goes on to say, "that Mr. Street has chosen rather to rely on real poetry of idea and arrangement than on mere tricky effect; a kind of vulgar advertisement that is sure to disgust as soon as the novelty is worn off and the artifice discovered, reminding one for all the world of a Richardsonian theatre, with all the performers in full costume standing in front."

One might almost fancy that such an utterance was intended for sarcastic condemnation, for it is really true and correct of some portions of the design, especially about the Central Hall. It certainly is damning them with the faintest praise. As a matter of fact, the outside buildings are the mere shells to the kernels, for the courts are arranged inside, where, according to the above, "the noble effects, poetry of idea, &c.," should be hidden away, and the outside left bare and naked as a barn! Has it, after six years' toil and anxiety, come to this at last? We can only express our astonishment that any friends or admirers of Mr. Street should put forth such arguments. The truth is that the principal portion of the front for a length of one hundred and forty feet is a mere tricky artifice and invention, "which is sure to disgust as soon as the novelty is worn off." The natural arrangement of the rooms appears from Mr. Street's statement to have given place to effect and artifice, for the Central Hall is so ill-conceived and badly proportioned with the adjoining facades that it is properly enough kept back almost out of sight, and in its place a broken-up parapet on a wall six feet thick is made to do duty. This portion of the building is supposed to be of more importance than that to the east, yet it is not only a story lower, but full from end to end "of tricks and artifices, which are sure to disgust as soon as the novelty is worn off." II.

ASPHALTE FOR STREET PAVEMENTS.

SIR,—I have read with great interest your articles, or rather Mr. Haywood's elaborate report, on the use of asphalt for street pavements. Though Mr. Haywood is, to all appearances, impartial in his observations on the advantages and disadvantages of asphalt, and no doubt conscientious in all he says, still I think he has under-estimated the disadvantages of this material when used as pavement for streets. Mr. Haywood, for instance, mentions the number of horses that fall in a given time on granite and asphalt, but he does not mention two circumstances: one is the difficulty of horses rising up when they have once fallen down on asphalt, and the other the number of horses that slip without falling. A short time since, when in the Gower-mews, near Bedford-square, I happened to see a very fine horse, and I passed a remark on it to the owner of the stables, and said what a fine horse it was. "Yes," he said; "it is a very fine horse, but it is injured for life, and almost worthless." I asked why, and he said it got "ricked" while passing over asphalt. It appears the horse did not fall, but its legs slipped away from each other, and so sprained the tendons of one of its legs as to incapacitate it for work. I was also informed that horses are known frequently to slip in this way and to injure themselves. Here, then, is an item, and a most important one, too, which should be considered when speaking of the disadvantages of asphalt. I have no interest in the matter one way or the other, and I should rejoice if asphalt were found superior to granite or any other paving material. My only desire in writing you this is that all the facts of the case should be fairly considered.—I am, &c.,

A MAN IN THE STREETS.

ORNAMENTAL BRICKS.

SIR,—The letter of "Jack of All Trades" on the above subject is interesting; but, not intending disrespect, I hope to be pardoned if I pronounce it more pretty than practical. It is not sufficiently explicit as to either results or process. When a grainer, with very exalted notions of the capabilities of his craft, operates upon the door even of a low-rented house, "built to sell," although he may heat Nature into fits by his dandified oak, we know what he intends that we should take it for; so also with his splendid imitations of marble in the mantelpieces; the veining or mottling may be richer than was ever seen in the real article, but he usually has one species or another in view during his too skillful performance. Now as to results from these clay mixtures; it seems altogether uncertain what particular kinds of marble or rock the "fat yellow," the "fine fat deep blue," and other sorts of coloured clay may be combined to imitate successfully. But it may be admitted that the product may be very slightly and serviceable, although not an imitation of any known rock—a building material *sui generis*. As regards process there is no mention of burning, but it may be assumed that this ornamental or variegated terra-cotta, for "columns, capitals, bases," &c., would be burned in the ordinary way. "Jack" mentions "silicate of soda," to be used as a varnish, I presume. This is really a salt, the permanency and unchanging character of which is not to be relied on, especially in exposed situations. The mention of heat and of silicate of soda reminds one of Mr. Frederick Ransome's early processes in the manufacture of artificial stone. To fix the silicate of lime, the stones were burned in a kiln, and the effect of the superheating was that the silicate attracted more silica, and became changed into a species of glass. The fatal defect of this method of fixing the

silicate of soda was that the heat warped and cracked the moulded articles, and straight lines or true form could never be depended on in the kiln-burned articles. This mode of manufacture was abandoned more than twenty years since. Not having seen any of the variegated ornamental bricks recommended by "Jack," I cannot judge of their quality or fitness for use in architectural decorations; but I have seen the imitations of granite and marbles of various kinds that are made by the Ransome Stone Company at East Greenwich. The basis of these productions is silica, and they are certainly, as it seems to me, better fitted by their appearance and actual texture, for association in architectural edifices with real rock of other kinds than argillaceous material, however treated.—I am, &c., SAMSON CHIP.

Intercommunication.

QUESTIONS.

[2404.]—**Land Surveying.**—Will some one through the intercommunication column of this journal inform me of the best and cheapest work on land surveying at the present day?—J. P.

[2405.]—**Projection of Shadows.**—I shall be glad to be recommended a cheap and concise treatise on the projection of shadows.—A. G.

[2406.]—**The Centrolinead.**—Can any kind reader supply me with the rule for applying the centrolinead, and also the best paper, pens, and ink for etching?—H. B.

REPLIES.

[2371.]—**Patches on Drawings.**—If "M. R." will wash the spots over with a little oxgall, he will find the paper will take the crayon or pencil as may be wanted. If the grease has got into the paper, the use of the knife and the razor will be of no good.—L. P. D.

[2375.]—**Wrought Iron Ties.**—In reply to your correspondent "Rust," I would observe that both the iron and the oil should be hot, although the temperature of the latter is not of any material consequence.—B. Z.

[2377.]—**Cross-Staffhead.**—The use of this surveying instrument has long since exploded. It would never be trusted to take angles in the way "J. H." supposes. For laying off perpendicular offsets the optical square is now universally used, and for other angles, when the range is small, the pocket-sexant or prismatic compass. It is not to be wondered at that "J. H." should be unable to find a description of the instrument he mentions. No text-book would ever illustrate such a crude method of taking angles.—T. C.

WATER SUPPLY AND SANITARY MATTERS.

NEWPORT (Monmouthshire).—The Newport and Pillgwenly Water Works Company will apply to Parliament next session for powers to obtain an increased supply of water. The spot from which the company hopes to obtain this increased supply is in the neighbourhood of Risca. By the company's proposed new arrangements the water supply of Newport will be secured by gravitation.

THETFORD.—The Thetford Local Board has approved of the plans submitted by Messrs. Whittaker & Parret, engineers, for the disposal of the sewage of the town, and, with certain modifications, those plans will be carried out.

STAINED GLASS.

MAIDENHEAD.—The north chancel window of St. Luke's Church, Maidenhead, has been filled with stained glass. The window is divided into two lights, one of them containing "The Agony in the Garden." The second light is occupied by the figure of "The Good Shepherd" carrying a lamb, while other sheep are at the Saviour's feet, drinking of the "Water of life." The window has been executed by Messrs. O'Connor, of London.

KILMARNOCK.—A series of twenty-four stained glass windows is being executed by Messrs. W. & J. J. Kier, of Glasgow, for the High Church, Kilmarnock. The last of the number is presently on view in their show-rooms. Its subject is intended to illustrate the New Testament doctrine of the common participation of "all nations and tribes" of mankind in the benefits of Christianity, being a representation of "Our Lord" surrounded by types of the Asiatic, European, African, and American races, all regarding him with looks of mingled reverence and admiration. The style is of the fifteenth century. It may be mentioned that Messrs. Kier's father was the craftsman who inserted the famous Munich glass into the windows of Glasgow Cathedral.

The new Ramsden dock at Barrow-in-Furness will be 200 acres in extent, and will be 3 ft. deeper than any dock on the west coast.

LEGAL INTELLIGENCE.

BREACH OF CONTRACT.—BRYANT v. LAY.—This was an action in the Court of Queen's Bench, on Monday, before Mr. Justice Mellor and a special jury, for an alleged breach of contract into which the plaintiff, who was an engineer, had entered at the request of the defendant, who was at the time the agent of the Japanese Government in this country. The plaintiff was to be employed as assistant engineer in the construction of a railway from Yeddo to Yokohama, and the question was one purely of liability—viz., whether the defendant was personally liable for the alleged breach of the Japanese Government. The jury ultimately returned a verdict for the plaintiff.

ACTION FOR INJURY TO A BUILDING.—At the Court of Record, Manchester, on Monday week, before Mr. J. Kay, Q.C., an action—Lawrence and another v. Connelly—was brought for the sum of £50 damages for injuries done to a house at Chetham-hill. The defendant was the owner of a house at Chetham-hill, and he had upon it a cottage which adjoined some property belonging to the plaintiff. With the view of improvement with respect to defendant's property, he razed the cottage, and erected two buildings upon the land. In getting out the foundations it appeared that, although underpinning was resorted to as an exercise of care, the excavations, or under-settings, were carried so low that a consequent subsidence of the plaintiff's walls followed, producing injuries to his house by ceiling cracking, disturbance of plastering work, damage to brick-work, and fall of floors. Witnesses were called on behalf of the plaintiff, whose evidence went to show that it would require £100 to put it in a tenantable condition. It was admitted on the part of the defendant that he was to blame, and that he ought to pay something, and the question was the amount of compensation to be made. The judge said if the jury believed the evidence given by the plaintiff's witnesses, they would agree that damage had been done to the extent of at least £90, but in that court they could not award more than £50. The jury returned a verdict for the plaintiff—damages, £25.

AN M.P. CHARGED WITH PULLING AN ARCHITECT'S NOSE.—On Friday week the Leeds Borough Police Court was densely crowded, the attraction being that Alderman Carter, one of the members of Parliament for the borough, was charged with assaulting Mr. Mallinson, architect, of Leeds and Dewsbury, and Mr. J. K. Rowbotham, oil merchant, Leeds, at the recent Dilke meeting in that town. Alderman Carter was chairman of the meeting. The meeting was a ticket one, and the Conservative party issued and distributed a number of false vouchers. It was in preventing the admission of persons holding these false tickets that the alleged assaults took place. It appeared that Mr. Mallinson was with Mr. Rowbotham and another gentleman in the corridor during the disturbance, and he stated that Mr. Carter first pushed him back and then tweaked him by the nose, afterwards saying, "Oh! I beg your pardon; I did not mean it for you. I am sorry." Mr. Mallinson said he had a proper ticket. For the defence, it appeared that Mr. Rowbotham was the obnoxious person whom the promoters of the meeting desired to eject, and that the striking of Mr. Mallinson was accidental, there being great disturbance and great excitement. Mr. Bruce (the Stipendiary) said that if Mr. Carter had attempted to strike Mr. Mallinson, then he should have said it was an assault; but in this case Mr. Carter was only preventing persons from entering the hall who held forged tickets. He consequently thought that in this particular instance he was justified in dismissing the summons, on the ground that the assault was of such a trifling character that it did not deserve any punishment. Mr. Granger then stated that after that intimation from the magistrate he should withdraw the other informations connected with the case.

LAND AND BUILDING SOCIETIES.

THE CONSERVATIVE LAND SOCIETY.—The nineteenth annual meeting of members was held at the society's offices, Norfolk-street, Strand, on Tuesday afternoon, the chair being occupied by Colonel Brownlow Knox, owing to the temporary indisposition of Lord Ranelagh, who, however, was able to be present. The report of the executive committee and statement of accounts showed a total of cash receipts for the year ending Michaelmas last amounting to £136,014, and for the period from the commencement of the society to the same date the sum of £1,719,373, whilst the shares issued during the year numbered 1,716, and the total from the commencement 36,472. The building advances during the year were £51,500 13s. 3d., against £63,241 15s. 6d. last year, evidencing, as the report observed, the caution of the board in this important element of business. The reserve or surplus fund remains as last year, £10,500, exclusive of office premises and furniture account, estimated at £2,348. The withdrawals under the rules since the formation of the society to Michaelmas amount to £141,694 17s.; and the committee were enabled, after leaving the reserve or surplus fund at £10,500, to provide for the interest at £5 per cent. per annum on shares (completed or paid

a year in advance), and for the interest of £4 per cent. per annum in deposit department; also to add £5 per cent. to the accounts of members, in their pass books holding uncompleted invested shares not in arrear, in respect of which no interest warrants have been issued. Every payment, therefore, on the shares on the register of members, at the present annual meeting, not being in arrear, will thus realise £5 per cent. per annum for the year ending the 30th September, 1871. The rate of interest on shares (completed) and those in progress (paid a year in advance) remains for the present at £5 per cent. per annum, and the interest on deposit (that is, for investors not members of the society) remains at £4 per cent. per annum, payable half-yearly.

SOUTHMOLTON.—The annual meeting for the election of officers and the transaction of usual business of the Southmolton Freehold Land Society was held on Monday week. It has been established for ten years: and the report showed the receipts from members' subscriptions, fines, bankers' balance, and otherwise, during the past year, to be £1,084 15s. 8d.; and payments by advances on mortgage, on savings bank account, secretary's salary, bankers' balance, and otherwise, to a like sum. It appeared that during the past year twenty-seven new shares had been taken up, and that £485 18s. 6d. had been advanced to members on mortgage and on savings bank account. The directors had pleasure in declaring a dividend of £5 per cent. on each member's balance, and congratulated the members on the greatly-improved position of the society, shown by the fact that the whole of the money representing the shares of subscribing members had been absorbed by the sums advanced on mortgage.

Our Office Table.

ARCHITECTURAL ART CLASSES.—A lecture will be delivered by Mr. J. P. Seddon, at the Architectural Museum, Tufton-street, Dean's-yard, Westminster, on Saturday afternoon, the 16th inst. at 3 o'clock; on "The Conventional Treatment of Ornament of the Early English Period." This lecture is the first of a short series proposed to be delivered on "Architectural Ornament and Sculpture," and will be free to members of the Institute and Association; and to all architectural students upon payment of 6d. for entrance to the museum.

INCREASING SCARCITY OF OAK TIMBER.—According to a recent return, oak timber is rapidly disappearing from Europe. In France, since 1869, no oak has been felled until full grown, that is, until within 30 years of its probable decay. The consumption of oak timber in France has doubled during the last fifty years. In 1866, £10,000,000 worth was consumed, of which £500,000 worth was imported, against £5,000,000 worth consumed in 1820, of which £400,000 worth was imported. France requires every year 15,000,000 cubic feet of oak timber for wine casks, 600,000 for her fleet, 150,000 for railway cars, and 750,000 for building purposes. In 1826, the total value of imported staves was £800,000; to-day the total value is £5,000,000. A similar increase of the importation of oak for the next thirty years would probably double the price. France, after losing Alsace and Lorraine, contains 135,000,000 acres, of which 20,000,000 are covered with forest. In Norway, the Administration of Forests declares that it is necessary to stop the cutting down of timber. The same enormous consumption is going on all over Europe. Holland and Belgium are nearly denuded of timber, and are large importers. North Germany is rich in forest, but within half a century has begun to cut down young trees. Austria has sold her forests by auction since railways have been introduced. Spain and Greece are almost absolutely woodless.

PUBLIC WORKS IN PARIS.—The Paris Town Council is saving 3,000f. a night by lighting only 16,000 of the 24,000 city lamps. In summer the councillors hope to save 45,000f. nightly. Paris was so brilliantly lighted under the Empire that the suppression of 8,000 lamps is but a very small hardship. Though the city is saving on one hand, it is spending considerably on the other. It has already begun to replace the 15,000 trees destroyed in the Bois de Boulogne. As the trees to be transplanted are at least 15 years old and come from Fontainebleau, the operation is a very expensive one. Oak, elm, and plane trees are the species adopted.

PROFESSOR HUXLEY AND MRS. GARRETT-ANDERSON ON VENTILATION.—Mrs. Garrett-Anderson, M.D., in moving at the School Board for a Select Committee on the Sanitary Arrangements of the School, said that she wanted from 800 to 1,000 cubic feet of air-space to each child. Her object is excellent, but her requirements are exaggerated. Professor Huxley said that, with such requirements

the schoolrooms must be 90ft. high, which shows, according to the *British Medical Journal*, that, great authority as he is in most physiological questions, he has not studied this one very carefully. Height above 12ft. to 16ft. cannot be taken into consideration in estimating cubic air-space for ventilating a room.

THE CLOSING OF A CITY CHURCH.—The church of St. Mildred's, Poultry, opposite the Mansion-house, was recently closed for ever. The fiat of the Bishop of London was read at the last vestry. His lordship deemed it undesirable to hold a closing service, as the building is almost unsafe. For many years few attended the services, and of late it was always doubtful whether the canonical number of three hearers would be present. Scarcely a dozen people sleep in the parish. The Vestry Clerk stated that on his appointment in 1848 every vestryman slept in the parish, now only one; such is the altered state of society. The valuable site of 4,000ft. or 5,000ft. is now for sale by the Ecclesiastical Commissioners. A part of the proceeds will be appropriated to erect a church in St. Paul's, Clerkenwell, with 8,000 souls, where the Rev. A. Styleman Herring acts as incumbent. About 1,000ft. has been bought (for a nominal sum) by the Commissioners of Sewers to enlarge the road and footways. The scheme has been eight years in perfecting.

RAVENNA.—If we seek through the world for a city which is absolutely unique in its character and interest (says the *Saturday Review*), we shall find it at Ravenna. It is a city in which, as soon as we set foot, we at once find ourselves among the memorials of an age which has left hardly any memorials elsewhere. The sea which once gave Ravenna its greatness has fallen back and left the once imperial city like a wreck in the wilderness. In the like sort the memory of an age strange, if not glorious, full of great changes if not of great deeds, has passed away from other spots without leaving any visible memorial; at Ravenna the memorials of that age are well nigh all that is left. It is well that such a strange corner of history should still abide as a living thing in one forsaken corner of Europe. It is well that there should be one spot from which the monuments of heathen Rome and of Mediaeval Christendom are alike absent, and where every relic breathes of the strange and almost forgotten time which comes between the two. At Ravenna the amphitheatre of Verona and the Cathedral of Milan, nay, even the more venerable temple which covers the bones of Ambrose, would alike be out of place. We walk its streets, and we feel glad that we do not walk among the stately arcades of Padua and Bologna, that our eye is not met by such memories of municipal freedom as we see at Pistoia and Piacenza, or by such frowning relics of signorial and ducal rule as seem still to keep their grasp on Milan and Verona.

PLASTERING.—CLASS OF CONSTRUCTION, ARCHITECTURAL ASSOCIATION.—At the meeting of this class on Friday next, the 22nd inst., the subject to be treated of is "Plastering." The following are the questions to be worked out by the members:—1. Explain the term "stucco," "rough stucco," and "rough cast." What is meant by "coarse," "fine," and "gauged" stuff? 2. Give a detailed description of what you consider the best method of forming a plaster ceiling. 3. What is the value of 100 yards superficial of lath plaster float set and twice white? Give in detail the labour and materials required. 4. What are carton-pierre and papier-maché? How are ornaments formed in each, and what advantage is gained by their use? 5. What is Parian cement? Give its principal uses. 6. How should a surface be finished when intended for oil or distemper decoration? 7. Fully describe any methods of treating plaster ornamentally with which you are acquainted, with the manipulation of the materials.

THE PROPOSED SOUDAN RAILWAY.—The staff of engineers sent out by Mr. Fowler, on behalf of the Government of Egypt, to survey and lay out the proposed Soudan railway, have already commenced operations on the whole length of the line between the Second Cataract and Khartoum. The staff, which consists of twenty experienced English surveyors, an English surgeon, and numerous native assistants, are all in excellent health, and speak highly of the arrangements of the Egyptian Government in carrying out Mr. Fowler's programme for their progress and work.

RECLAMATION OF LAND FROM THE ESTUARY OF THE TEES.—Tees side seems destined to become a great place. Since the discovery of ironstone in the Cleveland Hills, and the erection of blast furnaces to convert it into pigs, the growth of the district has been truly marvellous. The Tees Conservancy

Commissioners, besides deepening the river, have reclaimed hundreds of acres of land in the estuary of the Tees. During last week two arbitrators were sitting at Stockton taking evidence, in order that they might decide what price the owners of the foreshore ought to pay for any part of this reclaimed land, they having under the Commissioners' Act of Parliament the first chance of purchase. Doubtless when this question is settled the land will soon be utilised.

THE NEW LAW COURTS.—"A Fellow of the Royal Institute of British Architects" writes to the *Standard* as follows:—"In reply to the numerous and just animadversions which have recently appeared in the public journals on the design for the above last prepared by Mr. Street, its advocates urge that, as it has been formally accepted by the Office of Works, Mr. Street cannot be interfered with, unless by a special Act of Parliament. That this defence is as untrue as it is ungracious must be evident on referring to the printed 'Memorandum of the Terms of Appointment of Architects for Public Buildings,' issued by the Office of Works about a year ago, and by which Mr. Street's employment is governed. The document (Clause 2) provides that, 'if the Commissioners or Government should abandon the intention of erecting the proposed building, the architect should be entitled to a sum to be fixed beforehand, and to the return of his sketch.' Also (Clause 12), 'If after the working drawings complete for the execution of the entire work have been made, the Commissioners should fail to invite tenders, or make a contract and proceed with works, the architect shall be entitled to be paid a fixed sum,' &c., as before. There is also a general arbitration clause."

PROPOSED NEW RAILWAY JUNCTIONS IN THE METROPOLIS.—The London and South Western Railway Company intend applying for power in the ensuing session to effect a junction between their line and that of the London, Chatham, and Dover Railway Company by means of a short line from the Waterloo Station to the Blackfriars Station of the latter company. The Metropolitan District Company propose an extension of their line to that of the South Western Company at Barnes. The railway is proposed to commence by a junction with the West Brompton line near the Warwick-road, and to pass by a bridge over the Thames through Wandsworth and Putney to the Barnes up-station of the South Western line. It is proposed to utilise the railway bridge as a foot bridge for passengers, tolls being levied. Another scheme in the same direction is proposed under the title of the Metropolitan and Wimbledon Railway. The line is to leave the Metropolitan Railway at West Brompton, and is to join the London and South Western Railway about 400 yards from the Barnes Station. The Wimbledon branch will leave the first line at Dyer's-lane, Putney, and will terminate at the top of High-street, Roehampton.

ROAD-PAVING IN PARIS.—A Paris correspondent says that the substitution of macadam for pitched-roads is now being actively continued in Paris. The city, desirous of reducing the expenses of maintenance, which rise in certain places to 16 francs the square metre of paved roadway, are adopting pavement, the maintenance of which costs only 1.75 francs the square metre. It is true that the expenses of first establishment are much greater for the pavement than for the macadam, but there exist in store nearly 20,000,000 of granite setts, and these are being turned to useful and profitable account. The alteration is being fast effected on those roads where the repairs are most costly, and it will be continued according to the decrease in the expenses of maintenance, but the macadam will be preserved on those roads on which the traffic is light and the wear in proportion.

THE VACANT LAND IN THE CITY OF LONDON.—It will be remembered that some time ago the Corporation of London appointed an officer whose duty it should be to take charge of and endeavour to let the great quantity of land at present vacant in the City owing to the various works of improvement which have been carried out of late years. At the last meeting of the Court of Common Council Mr. Isaacs asked whether it was true that the Improvement Committee had resolved, in effect, that it was not desirable to place any of the vacant land in the disposition of the Committee in the hands of the officer recently appointed. Mr. Deputy Fry said that the Committee, by a decided vote, had passed such a resolution. May we ask Why?

ADDITIONAL CLERKS FOR THE ARCHITECT OF THE LONDON SCHOOL BOARD.—Mr. C. Reed, M.P., moved at the meeting of the Board on Wednesday, that a clerk of the works be appointed to assist the architect, at a salary of £2 10s. a week, and that it

be referred to the committee to recommend the name of one candidate for appointment by the board. Mr. Hutchins considered that no efficient help could be secured for the architect under £3 a week, and made a motion to that effect. There being no objection to the suggestion made by Mr. Hutchins, the words "£3 a week" were substituted for "£2 10s.," and with this alteration the proposition was agreed to with dissent. On the motion of Mr. Smith, M.P., it was further resolved that a writing clerk should be appointed to assist the architect, at a salary of £80 a year, and it was referred to the Works Committee to recommend the name of one candidate for appointment by the board.

CITY OF EDINBURGH IMPROVEMENT TRUST AND THEIR ARCHITECT.—At a meeting of the Improvement Trustees held on Tuesday, the Lord Provost moved the re-appointment of Messrs. Cousin & Lessels as architects. Bailie Miller seconded the motion, and stated that during the past year the work done by their architects, if paid by fees, would have cost the trustees £910 instead of the salary of £600. By continuing the same arrangement during the next year they would save several hundreds of pounds in connection with Chambers-street and Jeffrey-street. Bailie Lewis contended that the remuneration was out of all character with the amount of work required, and he proposed—"That, in respect that the duties of the architect are very materially diminished of late years, it be remitted to the Works Committee to reconsider the duties and salaries of the architects, and to report." Bailie Howden seconded the amendment. Mr. Gowans moved that Messrs. Cousin & Lessels be re-appointed, but that the plans and elevation of the streets should be left to the architects of the feuars, but it was decided that such an amendment was incompetent, and must be brought forward as a substantive motion. (Mr. Gowans subsequently gave notice of a motion to this effect.) Bailie Lewis's amendment was carried by 11 to 9 votes.

AMIENS CATHEDRAL.—It stands in the midst of the cold, white town, and has a high-shouldered look to a spectator accustomed to the minsters of England, which cover a great space of ground in proportion to their height. The impression the latter give is of magnitude and mass; this French cathedral strikes one as lofty. The exterior is venerable, though but little time-worn by the action of the atmosphere; and statues still keep their places in numerous niches, almost as perfect as when placed there in the thirteenth century. The principal doors are deep, elaborately-wrought, pointed arches; and the interior seemed to us, at the moment, as grand as any that we had seen, and to afford as vast an idea of included space; it being of such an airy height, and with no screen between the chancel and nave, as in all the English cathedrals. We saw the differences, too, betwixt a church in which the same form of worship for which it was originally built is still kept up, and those of England, where it has been superseded for centuries; for here, in the recess of every arch of the side aisles, beneath each lofty window, there was a chapel dedicated to some saint and adorned with great marble sculptures of the Crucifixion, and with pictures execrably bad in all cases, and various kinds of gilding and ornamentation. . . . There is not much painted glass—one or two very rich and beautiful rose windows, however, that looked antique, and the great eastern window, which I think is modern.—*Nathaniel Hawthorne's Notebook in France and Italy.*

SOUTH KENSINGTON MUSEUM.—With a view to the completion of the collection of water-colour paintings illustrating the history of that art, Mr. William Smith, Vice-President of the National Portrait Gallery trustees, has allowed Mr. Redgrave, R.A., the Inspector-General for Art, to select from his choice and valuable collection as many rare specimens as in Mr. Redgrave's judgment would illustrate the early period of this national art. The works selected by Mr. Redgrave have been presented by Mr. Smith to the nation.

DEATH OF THE OWNER OF THE "HOUSES IN CHANCERY."—On Wednesday Miss Reid, of Stamford-street, a rich and eccentric old woman, was found dead in her chair. She was tenant for life of a large quantity of house property in various parts of London, the utterly ruinous condition of which was so remarkable that they were popularly known as "the haunted houses," or the "houses in Chancery." Having quarrelled with her nephew, to whom it would fall in succession, and finding that she could not, by will, "cut him off," she at once got rid of the tenants and let the property fall into a state of dilapidation. Such, at least, is the story of the gossips of Stamford-street.

LIVERPOOL ARCHITECTURAL AND ARCHEOLOGICAL SOCIETY.—At a meeting of the members of

this local society, held on Wednesday evening in the Royal Institution, Colquitt-street, the chair was occupied by Mr. T. D. Barry, who read a paper, contributed by Mr. Worsley, on "The archaeological interest connected with the figure of a pig carved upon the steeple of the Winwick Church." During the evening, Mr. Statham pointed out the fact of the introduction of columns at the side of the Charing-cross bridge, a defect, he considered, in the design. Subsequently, the same gentleman asked if any member of the society could explain the working of charcoal in connection with sewers. The chairman said the charcoal was placed in trays at the manholes of sewers, and when kept dry there was a total absence of offensive smells. If, however, the charcoal become wet, the effect was destroyed, but the charcoal could be burned again. It was a great failing in the sewerage of this town that there was no proper system of ventilating sewers. Some charcoal filters would last for years.

THE NEW MINT.—The proposal to erect the new buildings for the Mint on the Thames Embankment is likely (according to the *City Press*) to meet with a considerable amount of opposition. The buildings are not expected to be very ornamental, and it is urged, with much reason, that so good a sight may be turned to better account. It would, indeed, be a pity if, after all the trouble and outlay that has been incurred to secure this important work, it should be disfigured in the way proposed. Something better than tall chimneys and factory windows may surely be looked for there.

CHIPS.

A new fire-engine station for Clerkenwell is to be erected on the site of the Cobham's Head, King's-cross-road (opposite Exmouth-street). The cost will be £3,750. Mr. John High is the contractor.

In consequence of the continued serious illness of the Prince of Wales, the distribution of medals and prizes of the Female School of Art, Queen-square, at which the Princess Louise had consented to preside, is postponed for the present.

Extensive dock-works are about to be constructed in one of the southern ports of Spain, the execution of which has been entrusted to Messrs. Bell & Miller, C.E., of Glasgow. Mr. Miller is at present in Spain making the necessary preliminary examinations, surveys, and plans.

The greater portion of the extensive range of buildings known as the Borough-road Normal Training Schools, belonging to the British and Foreign School Society, was, early on Monday morning, entirely destroyed by fire. Considerable additions to the buildings have only just left the builders' hands.

A recent test of wire rope as compared with hemp, in strength, made at the new Brooklyn navy yard, showed that for ropes of the same diameter the wire rope is stronger; but for ropes of the same price the hemp rope is stronger, and thus the cheapest in the first instance.

Messrs. Garrett & Sons, the agricultural implement makers, of Leiston, Suffolk, are considerably increasing their works, and a new set of workshops are to be erected from designs by Mr. Peck, the architect of the Agricultural Hall, Islington.

A project is entertained in Paris of erecting four new theatres on the Boulevard du Temple, by the Place du Chateau d'Eau.

Since last February no less than twenty-three companies for conducting the construction of asphalt paving have been started in England, with an aggregate capital of £3,220,000.

The new Foreign Cattle Market, Deptford, is to be formally opened on the 1st January. The cost is roughly estimated at £210,000.

A society of painters in water-colours has been established in Liverpool, and it is intended to hold an exhibition early in the coming spring.

The Middlesex magistrates have appointed a committee with instructions to seek a site for a school for girls, under the provisions of the Middlesex School Act, such site not to exceed four acres. They also intend to erect another pauper lunatic asylum for those of the incurable class.

The proprietors of the *Times* have recently obtained possession of the entire property of Printing-House Square, and it is said to be in contemplation to entirely rebuild the various offices connected with the paper, with a principal frontage to the new Queen Victoria-street.

The exhibition originally intended to be held at Lyons this year, but deferred in consequence of the war, will be opened on May 1st next. The presidency of the London committee has been accepted by the Lord Mayor, and the first meeting will shortly be held at the Mansion House. Intending British exhibitors should communicate to Mr. Edmund Johnson, 3, Castle-street, Holborn, Commissaire-délegué and hon. sec.

The Vestry of S. Clement Danes, Strand, have accepted the offer of the Government of £10,000 for the Vestry-hall, the Almshouses, and the now disused burial ground, the ground being required for the new Law Courts.

Some months ago, Mr. Charles Reade gave to the world some rather extravagant strictures on house-building and builders. The plumbers, in common with almost every other branch of the building trade, were somewhat severely handled by him. The *Spectator*, in speaking of the sanitary condition of Lonsborough House, says that Lord Lonsborough "did all he could to ensure the salubrity of his house, and is not to be blamed because the plumbers were, as usual, not to be trusted for anything except their charges. If we could hang one of them for murdering a prince, the world would be an improved place to live in."

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—ROYAL INSTITUTE OF BRITISH ARCHITECTS.—(1) Biographical Sketch of the late Sir James Pennethorne. By Mr. Arthur Cates, F.R.I.B.A. (2) "On a Water-Regulator." By Mr. Charles Geoghegan, M.C.I.A.A. 8 p.m.

INSTITUTION OF SURVEYORS.—Adjourned discussion on Mr. Clutton's paper, "On the Cost of Conversion of Forest and Woodland into Cultivated Land." 8 p.m.

TUESDAY.—INSTITUTION OF CIVIL ENGINEERS.—Annual General Meeting. 8 p.m.

WEDNESDAY.—SOCIETY OF ARTS.—"On the Study of Economic Botany, and its Claims Educationally and Commercially Considered." By Mr. James Collins. 8 p.m.

Timber Trade Review.

PRICES, December 11.—Timber (per load of 50 cubic feet): Riga, £3 5s. to £3 7s.; Memel and Dantzic crown, £4 to £4 10s.; best middling, £3 5s. to £3 15s.; good middling and second, £3 to £3 5s.; common middling, £2 10s. to £2 14s.; undersized, £2 10s. to £2 15s.; small, short, and irregular, £2 to £2 10s.; Stettin, £2 10s. to £2 15s.; Swedish, £2 7s. to £2 13s.; ditto small, £2 to £2 4s.; Indian teak, £12 10s. to £13 10s.; African oak, £9 10s. to £9 15s.; British Guiana greenheart, £5 10s. to £6 10s.; Cuba sabicu, £8 to £9.—Deals, &c., per Petersburg standard hundred: Archangel best yellow, £12 10s. to £14 10s.; ditto seconds, £9 10s. to £10; Petersburg best yellow, £12 10s. to £13 5s.; Wyburg best yellow, £9 15s. to £10; Finland and handsawn Swedish, £6 15s. to £7 15s.; Petersburg and Riga white deals, £8 to £9; Christiana, best deals (yellow and white), £10 to £12 10s.—Quebec pine: First floated, £16 to £18; ditto bright, £18 10s. to £20; second floated, £12 to £13; ditto bright, £13 10s. to £14 10s.

PRICES OF TIMBER AT HULL.

TIMBER. —Memel, best red.....	£4 0 0	to	£0 0 0
" Dantzic, best red.....	4 0 0	"	0 0 0
" Memel and Dantzic seconds.....	2 17 6	"	3 0 0
" Quebec red pine.....	3 15 0	"	4 0 0
" Swedish timber.....	2 12 6	"	2 17 6
" S. John's yellow pine.....	4 10 0	"	0 0 0
" Quebec yellow.....	4 10 0	"	0 0 0
" Quebec oak (per foot).....	0 2 9	"	0 0 0
" Quebec elm.....	0 2 3	"	0 2 6
" Memel logs.....	0 6 0	"	0 6 0
DEALS. —Onega.....	15 5 0	"	15 15 0
" Petersburg red (best), per standard 100.....	14 0 0	"	14 5 0
" Riga white.....	8 0 0	"	8 5 0
" Gefle (best), 3-11.....	12 15 0	"	0 0 0
" Gefle 3-9.....	12 5 0	"	0 0 0
" Wyburg red.....	11 0 0	"	11 5 0
" Gothenburg red.....	9 5 0	"	0 0 0
" Memel seconds (red wood).....	10 5 0	"	0 0 0
" Quebec first yellow pine	19 15 0	"	0 0 0
" Quebec second yellow pine.....	14 5 0	"	0 0 0
" Richibucto best pine.....	15 5 0	"	0 0 0
" Richibucto seconds.....	10 5 0	"	0 0 0
" S. John's spruce.....	8 5 0	"	0 0 0
STAVES. —Memel crown.....	18 0 0	"	19 0 0

Trade News.

WAGES MOVEMENT.

AYR.—The operative slaters of Ayr, who are at present paid at the rate of 5d. per hour, with 8d. per day extra when working in the country, have applied to their employers for an advance to 6d. per hour after March 1 next.

TENDERS.

BRITON FERRY.—For building a house at Briton Ferry, for Mr. David Pritchard. Mr. H. Francis Clarke, architect:—

Morgan	£234
Thomas	310
George.....	285
Rees.....	249

CLERKENWELL.—For erection of New Fire Engine Station, King's Cross-road, for the Metropolitan Board of Works:—

High (accepted)..... £3750

COLCHESTER.—For the erection of a new Meeting-house for the Society of Friends, Colchester. Mr. H. Baker, architect:—

Dobson	£1874	0 0
Gardner	1800	0 0
Lee	1676	15 0
Brown (accepted).....	1570	0 0

HASTINGS.—For erection of new Parochial Schools and Teachers' Residences, S. Andrew's, Hastings, for the Misses Sayer. Messrs. E. Habershon & Brock, architects:—

Rodda	£2728
Nightingale.....	2666
Wood.....	2600
Bridgeland	2498
Avis & Roe.....	2375
Catt	2335
Howell	2247
Vidler	2243
Parkes	2212
Hughes.....	2140

JARROW-ON-TYNE.—For erection of Nave and Vestry of new Church at Hebburn, for Mr. R. Carr-Ellison. Mr. E. R. Wilson, architect:—

Masons' Work.....	£802	11 0
Joiners' Work.....		
Irving	475	10 0
Slaters' Work.....		
Beck.....	75	10 0
Plasterers' Work.....		
Good	34	15 0
Glaziers' Work.....		
Wilkin & Dickman.....	44	0 0
Plumbers' Work.....		
Hedderly.....	7	0 0

NEWGATE-STREET.—For alterations at 117, Newgate-street, for dining-rooms. Mr. J. H. Rowley, architect:—

Rivett.....	£1171
Nind	1125
Crabb	950
Kilby.....	947
Newman & Mann.....	863
Heeps (accepted).....	827

PAISLEY, N.B.—For erection of Three Gas-holders for the Greenock Gas Company:—

Hanna, Donald & Wilson (accepted)..... £51,000

TOTTERIDGE.—For the re-pewing and painting of the Congregational Chapel, Totteridge, Herts. Messrs. Fuller & Cubitt, architects:—

	In Yellow Deal.	In Pitch Pine.
Bint.....	£368 0 0	£427 0 0
Wells	335 0 0	375 0 0
Harris & Sons.....	326 0 0	347 0 0
Walton	315 0 0	345 0 0
Gill	309 0 0	321 0 0
Noble	308 0 0	330 0 0
Woodhall	299 10 0	
Pritchard (accepted).....	288 0 0	
Torrington	274 10 0	

URMSTON.—For the new Wesleyan Schools, Urmston, near Manchester. Messrs. Fuller & Cubitt, architects:—

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Neill & Sons.....	2120
Thompson.....	2034
Davis & Maudsley.....	2017
Statham & Sons.....	1980
Foggett (accepted).....	1861

WISHAW.—For the erection of a house for W. Brooks, Esq. Mr. W. Swift, architect. Quantities by Messrs. T. C. & J. P. Sharp:—

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Langley (Walsley Ash).....	1158
Clarson & Son.....	1120
Langley (Minworth).....	1067
Townsend (accepted).....	1025

WORTHING.—For alteration at No. 14, Crescent, for Capt. A. B. Burnard. Mr. R. W. Edis, architect:—

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Adamson	2059
Conder	1916

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CONTRACTS OPEN FOR BUILDING ESTIMATES.

BOLTON, December 19.—For sewerage, forming, and ballasting Highy-street, Rupert-street, Norman-street, Channing-street, Crowther-street, Walton-street, and Back Stafford-street. Mr. R. G. Hinnell, Town Clerk, Corporation Offices, Bolton.

ONGAR, January 1, 1872.—For the erection of a new infirmary, hospital, schools, &c., at the Union House, Stamford Rivers, Essex. Charles Mott, Clerk, Chipping Ongar.

COLNE, January 3.—For the erection of a police station at Colne. Mr. Waddington, 5, Grinshawc-street, Burnley.

STOCKPORT, December 26.—For (1), the construction of a covered conduit, 1,400 yards in length, in Lynn Park, 1½ miles from Disley, with masonry and other work; also (2), for completing a reservoir, commenced during the last summer, in Lynn Park. Mr. G. Mather, Secretary, Millgate, Stockport.

YORK, January 25, 1872.—For the construction of the approach railway, to the proposed new station at York, making sundry new roads, and the building of new coal depôts, with the approaches, &c. The Secretary, North-Eastern Railway Company, York.

WEST HARTLEPOOL, January 25, 1872.—For the construction of a new dock at West Hartlepool, with the necessary entrances, and also for the construction of a double line of railway, 1 mile 52 chains in length. The Secretary, North-Eastern Railway Company, York.

HASTINGS and HAULTON, December 18.—For the erection of a block of dwellings in concrete at Hastings; also similar dwellings in Lennox-street and Priory-road, Haulton, Geo. Friend, Architect and Surveyor, Earl-street, Maidstone.

KENT, December 26.—For taking down and rebuilding the county bridge, at Bexley. F. Russell, Clerk of the Peace for Kent, Maidstone.

ADMIRALTY CONTRACT, December 19.—For supplying H.M. Dockyards with brasiers, brassfounders', and coppersmiths' goods (including brass cocks and brass and copper pipes). Mr. Francis W. Rowsell, Superintendent of Contracts, the Admiralty, Whitehall.

WHITEHAVEN, December 30.—For the construction of a wet dock and a short railway connected therewith. John Collins, Secretary, Town Hall, Whitehaven.

WINCHESTER, December 20.—For pulling down and rebuilding the house and shop, No. 32, High-street, Thomas Stopher, jun., Architect and Surveyor, No. 57, High-street, Winchester.

START LIGHTHOUSE, December 18.—For the construction of an additional dwelling, making alterations and additions to the tower, together with other works, at the Start Lighthouse, near Kingsbridge, Devon. Mr. Robin Allen, Trinity House, London, E.C.

HUDDERSFIELD, December 18.—For altering and enlarging the national schools, at Honley, near Huddersfield. Ben. Stocks, Architect, Bankfield-road, Huddersfield.

HUDDERSFIELD INFIRMARY, December 28.—For additions and alterations to the infirmary. John Kirk & Sons, Architects, Huddersfield and Dewsbury.

BILLERICAY, December 26.—For paving the footpaths on either side of the town of Billericay with 2½ in. tooled York paving.—Charles C. Lewis, Clerk to the Billericay Highway Board, Brentwood.

BEVERLEY, December 21.—For the erection of three thirteen-roomed villas on land adjoining the New-walk.—Mr. William Haw, North Bar-street, Beverley.

STRASBOURG, January 31, 1872.—For the erection of a Christian Protestant church at Strasbourg, to replace that destroyed during the late war.—President of the Consistory,

ABERDARE, January 4, 1872.—For the construction of a reservoir, with masonry and other works.—Mr. H. J. Collier, Clerk to the Board, Aberdare.

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BANKRUPTS.

TO SURRENDER IN THE COUNTRY.

Thomas Moore Dodman, Saint Helen's, builder, Dec. 13, at Liverpool.

SITTINGS FOR PUBLIC EXAMINATION.

January 17, H. Marchmont, Colville-square, Nottingham, and Stanmore, builder.—January 20, C. H. Trew, Elliott-road, North Brixton, builder.—January 10, H. Forrer, J. Bawden, & W. Phipps, Liverpool, engineers.—January 16, F. W. Taylor, Coleman-street, City, general agent and builder.

DECLARATION OF DIVIDEND.

J. Bates, Wolverhampton, brick and tile dealer, div. 5th.

SCOTCH SEQUESTRATIONS.

Walter Graham, Glasgow, ironfounder, December 13, at 12.—John Ramsay, Edinburgh, painter, December 16, at 3.

PARTNERSHIPS DISSOLVED.

Powell & Catlow, Liverpool, plumbers.—Seattergood & Fellows, Cannock and elsewhere, brick manufacturers.—Lingard & Austin, Oughtibridge, brick and tile manufacturers.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

LEAD.			
Pig—Foreign	per ton	£17 12 6	£18 0 0
" English W.B.	do	0 0 0	0 0 0
" Lead Co.	do	18 12 6	18 17 6
" Other brands	do	18 2 6	18 7 6
Sheet Milled	do	19 0 0	0 0 0
Shot, Patent	do	20 15 0	0 0 0
Red or minium	do	21 0 0	0 0 0
Litharge, W.B.	do	0 0 0	0 0 0
White Dry.	do	26 0 0	0 0 0
" ground in oil	do	0 0 0	0 0 0

COPPER.			
British—Cake & Ingot	per ton	£38 0 0	£91 0 0
Best Selected	do	90 0 0	93 0 0
Sheet	do	90 0 0	96 0 0
Bottoms	do	95 0 0	98 0 0
Australian	do	88 0 0	90 0 0
Spanish Cake	do	79 0 0	0 0 0
Chili Bars, cash	do	82 0 0	85 0 0
" Refined ingot	do	90 0 0	91 0 0
Yellow Metal	per lb.	0 0 7½	0 0 8½

IRON.			
Pig in Scotland, cash	per ton	£3 9 7	£0 0 0
Welsh Bar, in London	do	8 15 0	9 0 0
" Wales	do	8 0 0	8 5 0
Staffordshire	do	9 15 0	10 10 0
Rail, in Wales	do	7 10 0	7 15 0
Sheets, single in London	do	11 15 0	12 10 0
Hoops, first quality	do	10 15 0	11 10 0
Nail Rod	do	9 12 6	10 5 0
Swedish	do	11 5 0	12 0 0

OILS, &c.			
Seal, pale	per tun	36 10 0	37 0 0
Sperm body	"	90 0 0	91 0 0
Cod	"	35 10 0	0 0 0
Whale, South Sea, pale	"	36 0 0	37 0 0
Olive, Gallipoli	"	54 0 0	0 0 0
Cocanut, Cochin, tun	"	51 0 0	0 0 0
Palm, fine	"	39 10 0	40 0 0
Linsseed	"	33 10 0	33 15 0
Rapeseed, Eng. pale	"	45 10 0	46 0 0
Cottonseed	"	34 10 0	34 15 0

TIMBER.			
Teak	load	12 10 0	13 10 0
Quebec, red pine	"	3 15 0	4 15 0
" yellow pine	"	4 5 0	4 15 0
Quebec oak, white	"	6 0 0	6 5 0
" birch	"	3 15 0	5 0 0
" elm	"	3 15 0	4 5 0
Dantzic oak	"	4 10 0	6 10 0
" fir	"	2 7 0	4 0 0
Memel fir	"	3 0 0	0 0 0
Riga	"	3 0 0	3 10 0
Swedish	"	2 0 0	2 10 0
Masts, Quebec red pine	"	4 0 0	6 10 0
" yellow pine	"	4 0 0	6 10 0
Oregon	"	7 0 0	10 0 0
Lathwood, Dantzic, fm.	"	4 10 0	6 0 0
" St. Petersburg	"	8 0 0	9 10 0
Deals, per C, 12ft. by 3 by 9in.	"		
Quebec, white spruce	"	12 10 0	18 0 0
St. John, white spruce	"	12 0 0	14 0 0
Yellow pine, pr reduced C	"		
Canada, 1st quality	"	18 10 0	21 0 0
" 2nd do	"	12 0 0	14 0 0
Archangel, yellow	"	12 10 0	14 10 0
St. Petersburg, yellow	"	12 10 0	13 10 0
Finland	"	6 15 0	7 15 0
Memel and Dantzic	"	0 0 0	0 0 0
Gothenburg, yellow	"	8 10 0	10 10 0
" white	"	8 0 0	9 0 0
Gefle, yellow	"	10 10 0	12 10 0
Soderham	"	8 10 0	12 0 0
Christiana, per C, 12ft. by 3 by 9in., yellow	"	10 0 0	12 10 0
Other Norway	"	7 0 0	8 0 0
Flooring boards, pr square of lin., first yellow	"	0 10 0	0 11 6
First white	"	0 8 6	0 9 6
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THE BUILDING NEWS.

LONDON, FRIDAY, DEC. 22, 1871.

AN EXHIBITION AT MOSCOW.

THAT it should be contemplated to open, in June next, on the two hundredth anniversary of the birth of Peter the Great, an "International Polytechnic Exhibition," is not an unimportant sign of the times. The Russians, and especially those of interior Russia, have not hitherto ventured to compete with the Western nations in arts and manufactures, although it is true that they sent some remarkable pictures to Paris in 1867; but, upon the whole, their art, like their literature, has been childish, crude, and semi-barbaric. Therefore they have generally contented themselves with displaying the products of their mines and forests, which are rich enough, indeed. We, however, have had little commercial intercourse with them, except with the narrow fringes of country accessible through the Baltic and Black Sea ports, there having been practically no railways, no banks, and no knowledge, on the part of the people at large, of what England can make and sell. These deficiencies are at last supplied, and, upon the strength of her recent progress, Muscovy is bold enough to throw down a challenge to the world. The forthcoming exhibition, as its purposes are explained, will represent, in systematic groups, all objects connected with natural and technical science, the bearing of science upon practice in every-day life, rural economy, manufactures, and industry. There are to be fourteen departments, through which we shall travel as rapidly as possible. The starting-point is history, and Russian history really begins A.D. 1672, with the birth of the Great Czar. It will be exceedingly interesting to note the various developments of industry:—mining apparatus, building, and gear for sea and river navigation, rural and agronomical structures, agricultural implements, and machinery, such as it was in his time. Thence the eye will pass through the entire naval annals of Russia, from the same date to our own, and this also will be a very instructive series of illustrations. A third collection will, in a similar manner, deal with the record of Russian warlike invention and improvement; and a fourth with provision for the aid of sick and wounded soldiers. We do not delay ourselves with them, however, but proceed to a most characteristic collection of groups, formed by the Moscow Architectural Society, and consisting of designs, photographs of edifices, and parts of edifices ranging from the remotest periods, in chronological order, and according to their locality, but especially placed in groups by the side of Byzantine and Servian buildings and the contrasted architecture of the East and West. A technical subdivision of this department is to contain a full representation of builders' materials and tools, of all descriptions whatsoever, and from every region of the earth—a class which cannot fail to interest, and may not be without its useful suggestions even to ourselves. A valuable adjunct will be a cabinet of plans drawn by architects of all eras, and never carried out, on account of their ambitious or of their eccentric character. Possibly some of this hitherto barren genius or imagination, or whatever it may be, may yet bear fruit, with or without modifications. An attempt is to be made by that enterprising body to which we have already referred, the Moscow Architectural Association, which comes thus for the first time prominently into the presence of Europe, to explain the secrets of success in architecture. We are not so sanguine of its success on this point as upon some of the others; but it will certainly be a novelty to be taught lessons from beneath the shadow of that most wizard palace, or

tower, or castle, the Kremlin, the flash of whose domes strikes awe into the Boyard mind. Closely connected with this department, and particularly so for the Russians, who employ wood so profusely in the construction of their towns and villages, their railways and their roads, is to be another devoted to forests. Russia is, in this respect, the America of the Old World. Judging from the descriptions of travellers, her woodland world appears illimitable and exhaustless; but possessing little or no coal, and with a population so mighty that it strips whole districts every day, she, with a wise and far-sighted providence, takes her forests into the most assiduous care of the State, appointing Crown officers, of high rank and sumptuous emoluments, to keep in careful sight their geography, topography, economy, artificial cultivation, management, revenues, different natures of soils, animals being denizens of them, influences useful or injurious to them, materials, in addition to timber, which can be supplied from them to commerce—in effect, a periodical dendrology. It would be difficult to estimate the loss that has been sustained by what are vulgarly called the more ancient countries of the globe—as though all were not equally old, the phrase implying merely discovery, civilisation, and chronicles—by the habit of reckless disafforesting. It has withered away the fertility of Greece—once the garden of the South; it has converted teeming valleys into rainless deserts, and impoverished whole populations. Related to this subject is that of rural and agronomical science generally; and here it will be curious to mark the way in which the Moscow Commissioners, who comprise every class, from the Imperial Princes downwards, will apply themselves to the study of the various soils, samples of which will be sent to the "Capital of Cupolas" from every part of that vast and splendid, if as yet ill-compacted dominion; the different modes of cultivation and kinds of produce applicable to each; the methods of manuring; the breeding of cattle, and the employment of implements and machines, working-models of which are to be displayed at the Exhibition. In these respects, Russia has always, hitherto, been deemed backward, buying her mechanical necessities from Germany, England, and the United States, her own industry being deficient in point of ingenuity and, so to speak, genius. We might overlook the next department, practical zoology, did it not embrace within its scope some subjects to which our readers may assign a practical importance. For, besides the breeding of the silkworm, of bees, of fish, of oysters, lobsters, and a comparative exhibition, quite a new idea (well done, Russia!), of useful and noxious animals, with historical classifications of animal developments, it is to comprise models of aquariums and terrariums in every known pattern, which may afford suggestions not a little valuable. The only pity is that Moscow is so remote, and that everybody cannot go to see this unique show, though, indeed, everybody did not go to Paris, Havre, or Amsterdam. In this class of buildings, great errors are continually committed, as, for example, in the aquarium of the Crystal Palace, where all semblance of Nature is excluded, whereas, at Havre, you might almost have fancied yourself a diver groping, now with the pearl-fishers of the Persian Gulf, now with the coral collectors of the flower-bearing sea that laps with lazy waves the Coromandel coast, and now with the intrepid fellows who search for sunken treasure near the fearful Biscay shores. Thus, a distinct difference is perceptible between structures coming under these definitions, and, since they are becoming more popular, it is well that their true principles should be understood. At least, in the Moscow Exhibition, an unprecedented variety of designs may be anticipated. With the botanical department, scientific or practical, we have nothing, at present, to do, but that which refers to geology,

mineralogy, and mining, must command, peculiarly in such a country as Russia—which is the greatest mining country, though not for coals or iron, in the world—a singular attention. The proposal—a rather ambitious one—is to describe, by the aid of maps, tables, reliefs, and sections, the exterior outlines and the internal formation of the earth; but particularly the utilities of the industry arising from them; mining processes and implements, boring and piercing engines, pumps for delivering pits from an excess of water, means of lighting and ventilation, plans for extinguishing great subterranean fires, lifts for materials, coal, and ore; newly-fashioned furnaces; and improved mechanism for reaching, by the easiest possible agency, the wealth of the mine. Under the head of Technology fall drawings, models of manufactories, collections of raw and manufactured produce, apparatus and machines in motion, and testing instruments. It is within this range that the Russian competition promises to be as successful as daring, because advantage has been taken, by the people of Alexander's empire, of Western example and education. They are about to commemorate the birth of Peter the Great by emulating his docility. This, too, in "the section of Manual Manufactures, dedicated to small products made by the hand alone"—a species of industry swiftly fading out of sight, though it is associated with some of the most wonderful improvements ever made in the processes of labour for the benefit of mankind. The lathe, for instance, contains in itself the principal movement of the steam-engine. The exhibition is to set forth not only implements and apparatus for manual work, but also illustrations of every process possible with it. And this is a valuable idea; because, to whatever perfection and delicacy machinery may be brought, however vital it may seem, with all its thousand throbbings and apparently self-conducting motions, the primal power must eternally be the hand of man, obeying his brain. An engine is a dead thing after all until a man comes to feed it and set it going. Well, we need not dwell on the other divisions of this department; typography, lithography, type-founding, and engraving, though all will be actively represented; but the railway section may arrest us for a moment, detailing, as it will, an immense amount of information on the construction of lines, the supply of water, the materials and building of rolling-stock, the history of the broad and narrow gauges, the use of tramways and wire rails, postal and telegraphic communications, and—this being a topic peculiarly Russian—the various methods of dispatching mails where no railroads exist. Again, *non ragionam di lor, ma guarda e passa*; the Meteorological Cabinet; the comparative study of units of measures, weights, and dimensions; the Photographic Cabinet, exhibiting the entire technology of the art; the practical application of electricity to different purposes, including galvanic, plastic, self-writing; apparatus for obtaining gas; the lighting-up of aërostates; automations; Galiber's inventions; divers' armour; the employment of condensed and astronomical schemes; to pause at the Scientific Section, intended to "represent the present state of education and science in Russia and abroad, as regard its technical parts and educational materials or works;" the planning and building of school-houses; the laying-out and fitting-up of Frobel's Kindergartens; novelties in games; gymnasia. Whoever has heard of the unrivalled ingenuity of the Russians in these matters, the unique characteristics induced by their climate, their semi-European and semi-Asiatic habits, their long isolation from the rest of the world, and the conglomeration of races contributing to the population of that still dissolute empire, will expect no little surprise in these respects. Once more, we leave behind some sections—though the Medical, in other columns, will deserve important notice, in its anatomical, surgical, and

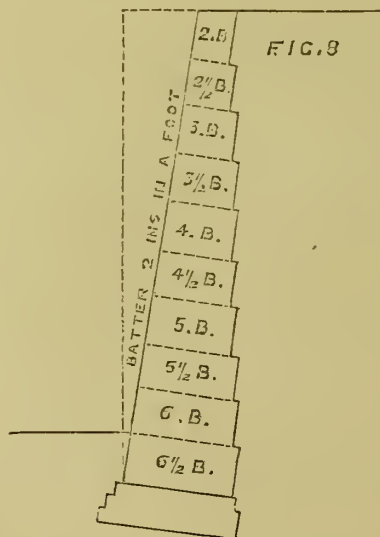
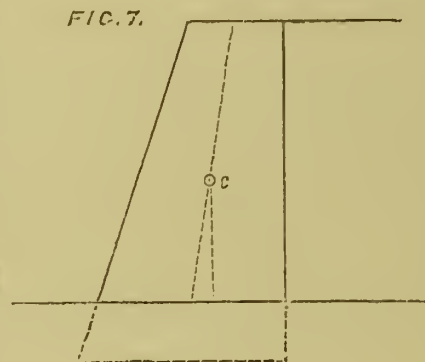
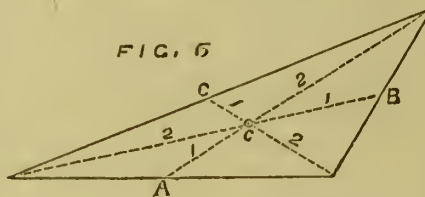
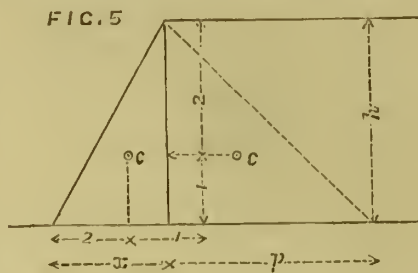
therapeutic classes, comprising the model of a children's hospital, specimens of electro-therapeutic, hydro-therapeutic, pharmaceutical chemistry, and the arrangement of pharmacies, laboratories; cabinets for the preparation of mineral waters; "medico-botanical gardens"—in order to reach department the Fourteenth, which the programme thus indicates:—"The Rural Architectural Department will contain the construction of a rural house, hospital, school, church, and the peasant's hut, with all the interior fittings; and it is intended to assist in solving questions of every-day life relating to comfort, improvement, and profit, as applied at the present time, at the least possible expense, so that all those articles shall reasonably answer the requirements of the cheapest rational comfort;" the Commissioners bearing in mind, nevertheless, the essential of artistic ornament, in a proportion to usefulness, up to a certain degree. It must be recollected that the Russians are a wondrously devout people, and that their churches are the most remarkable in Christendom—those of Moscow especially, those of St. Petersburg having been borrowed, to a great extent, from the modern Western type.

Among the miscellanies of Russian industry are the building of iron ships, the construction of rudders, the manufacture of nails and cordage, in all of which they exhibit a great, although somewhat rough, ingenuity. But it is not among these specimens that visitors from the West to the Moscow Exhibition will find their principal interest. It will be among the characteristically national constructions, the cottages, the swings and see-saws, the domestic utensils, the musical instruments, and so on, because these will enable us to appreciate better than at any former time the actual progress which the Russian people have made. Theirs, as we have said, is a history of not more than two hundred years; many of their provinces are still in a semi-savage state; they have great difficulty in obtaining machinery, and their artificers, as a rule, are not skilled. In point of fact, Russia is less of a manufacturing than of an agricultural country, and in all such countries mechanical industry is at a low ebb. But, after all, Moscow itself will be the chief attraction of the Exhibition. "Moscow of the golden domes," the most remarkable city in Europe, which once could boast of three hundred churches and fifteen hundred palaces, and even now displays a vastness and splendour unparalleled, with its terraced roofs of polished or painted iron, its tremendous fortress, its neighbouring villages, climbing up the sides of apparently inaccessible rocks, and the great palace of the Kremlin, with its walls of dazzling whiteness. Inside that structure, too, is a perfect Aladdin's treasury of jewels, whose value can hardly be computed. Again, the varieties of this singular city will afford many suggestive ideas to those whose travels have hitherto not extended beyond the French and German towns; a French hotel by the side of an Armenian house, an Indian temple close to a German castle, a mosque near a pagoda, colour and gilding in all directions; windows, balconies, turrets, alike fantastic; hospitals with not fewer than two thousand windows; strange vehicles in the streets, odd costumes, bridges of grotesque design, shops which might have been brought from every region of the earth, tea-houses, music-rooms, quays and dykes, more calculated, perhaps, to surprise than to charm, but still very picturesque and very unique. We anticipate, therefore, a good deal of interest from this Moscow Exhibition, which will be unlike every other that has preceded it, our only doubt being lest the distance deter thousands of persons from taking advantage of the opportunity who might otherwise have been glad to study so curious and instructive a spectacle. This spectacle, more than any other which Russia has given to the world since the foundation of the empire, will establish it among those

nations that are entering into the general competition of Europe, and give it a title possibly to rank upon an equality with them.

NOTES ON BRICKWORK.—VI.

WHEN one part of the length of a long wall is carried up to a considerable height before an adjoining length is commenced, the settlement of the bed joints is so considerable in the length first built that the adjoining length cannot be worked into it. There are then only two ways of building a long wall; either to carry it up all along in heights not exceeding about 4ft., or one scaffold



height, or to finish off each length with a straight joint, the courses in the next length being laid without regard to the beds of those of the preceding one. In the former case, the end of the work is either toothed or raked back to receive the courses of the following length. In tunnels and other heavy works subject to great and unequal pressure of earth, the latter method is sometimes obliged to be adopted in consequence of the long

time that elapses after one length is completed before another can be got in.

The courses of brickwork intended to carry weight are laid level, but in walls built for the purpose of retaining a bank of earth—retaining walls—the courses are sometimes laid at right angles with the face of the wall, which is usually battered. The resistance to the pressure of earth behind the wall is thus increased by bringing the weight of the wall above any bed joint to add to the resistance to sliding outwards when the stability of the wall is taken to depend on the resistance which one portion of the wall opposes to sliding over the portion below it; or to add to the resistance by throwing the centre of gravity of the wall further back when it is taken to depend on the resistance to overturning bodily on the toe of the wall as a fulcrum. When the wall is built with good mortar, the latter form of resistance may be calculated upon. To determine the thickness of a retaining wall on this supposition, it is necessary to take into account the manner in which the wall is backed up. If a great thickness of solidly-packed hard material be placed behind the wall, the wall itself need be no more than a mere facing to protect the backing from the weather; but where no special means are taken to prevent the thrust of the earth against the wall, then the pressure against it depends upon the angle of repose which the particular kind of earth assumes, the angle of repose being that angle or slope which the face of it naturally assumes when a heap is loosely thrown together. Thus dry sand naturally assumes a slope which departs from the vertical to the extent of about 60 degrees; damp clay about 45 degrees; wet clay 75 degrees. When the face of a mass of earth slips down for want of support, it divides at about half this angle; thus if a mass of sand were piled up behind a wall, and the wall were to be removed, the sand would slip down and form an angle on the face of about 30 degrees from the vertical.* It is this portion that the wall has to retain in its place. But in practice the accumulation of water in the materials behind the wall modifies the deductions drawn from these considerations. It is customary to lay drains to prevent this accumulation of water; but still it would not be prudent to suppose that even then the presence of water would not increase the liability of the material to slip or to press more heavily against the wall than it would do without such accumulation of water. The maximum pressure would be caused by a mass of mud behind the wall, having no more cohesion than a mass of water would have. A wall thus situated would be a dam rather than a retaining wall, as generally understood. Supposing, however, that the thickness of a retaining wall is calculated on that basis, it is more easily determined than when the variable conditions of wet or dry earth are taken into consideration. If the mass to be supported be supposed to have no cohesion, it would press with equal intensity sideways at any given depth, as vertically; that is to say, at any given depth the horizontal pressure would be equal to the weight of water above it.

Let us take a foot as the unit of measurement, and a pound as the unit of weight or pressure. To find what dimensions such a wall should have, so that its resistance would exactly balance the pressure against it, let Fig. 5 represent a vertical section of the wall. If the line p be drawn equal in length to the height h it will represent the horizontal pressure against the wall at the bottom. If the diagonal line be drawn from the extremity of p to the top of the wall it will represent the gradual decrease of pressure up to o at the top, and the mass of water inclosed in this triangle represents the pressure against the wall. The mean intensity of its pressure

*The angle of repose is properly the angle that the slope makes with the horizontal, but we have preferred for convenience to adopt the complement of this angle—its divergence from the vertical.

against the wall is at half its height, therefore the total pressure is found by multiplying the length of the wall into its height and into half its height, as representing the mean intensity of pressure.

If we say that l = the length of the wall in feet, h = its height in feet, p = the horizontal pressure of water at the bottom; that 62.5 = the weight of a cubic foot of water in lbs., and P = the total pressure on the wall in lbs., then

$$P = l \times h \times \frac{p}{2} \times 62.5$$

or, which is the same thing, p being equal to h ,

$$P = l \times h \times \frac{h}{2} \times 62.5,$$

or, which is the same thing again,

$$P = \frac{l \times h^2 \times 62.5}{2} = 31.25 l h^2.$$

To simplify and reduce figures, we may take $l = 1$ ft., for the equation will be equally true of 1 ft. as of any number, and if we say that $l = 1$, we simply drop the element of length out of the calculation, and say $P = 31.25 h^2$.

If we take an example, and say that $h = 12$ ft., the pressure against each foot in length of the wall will be

$$P = 31.25 \times 12 \times 12 = 4,500 \text{ lb.}$$

Now, there must be some one point in the height of the wall against which, if this force of 4,500 lb. were concentrated, its effect in tending to overturn the wall would be the same as it is actually, being spread over its height with an intensity varying from 0 at the top, to $12 \times 62.5 = 750$ lb. on each square foot at the bottom. This point is called the centre of pressure, and it is at the same height from the bottom as the centre of gravity of the mass which the wall sustains. The centre of gravity of a triangle is always at a point one-third of the height from its base to its apex. If we draw a separate figure (Fig. 6), and divide each side in the points $A B C$, and draw lines from the opposite angles to those points, they will all centre in the point c , and that is the centre of gravity of the triangle. Supposing a triangle cut out of a board and balanced on a pin, the point c , and no other, is that which will rest upon the pin, no one side of the board being heavier than another, and therefore balanced, the board being supposed, of course, to be of uniform thickness. It is always at two-thirds of the distance from the angle. It is, therefore, in this case at one-third of the height from the bottom, or 4 ft.

This being the centre of pressure, the whole pressure (P) may be supposed to be congregated there, and to act upon the wall with a leverage of 4 ft. This constitutes the force tending to overturn the wall on its toe as a fulcrum, and is $4,500 \times 4 = 18,000$ lb., and is called the moment of that force.

To balance this force there must be in the wall a resistance equal to it. Let h = the height of the wall in feet, as before; x = the thickness of the wall at the bottom; 112 = the weight of a cubic foot of the wall in lbs., and R = the resistance that will just balance the force of water against the wall. This resistance consists of the weight of the wall acting with a leverage equal to the distance of its centre of gravity from the fulcrum or toe of the wall. The centre of gravity is found in the same manner in this case as in the other; it is at two-thirds of the distance from the outer angle, or from the fulcrum, and is $\frac{2}{3} x$.

The resistance, therefore, is

$$R = h \times \frac{x}{2} \times \frac{2x}{3} \times 112 = \frac{112 h x^2}{3}$$

$$\text{and } x = \sqrt{\frac{3 R}{112 h}}$$

As R , the resistance, must equal the force, it must be 18,000 lb. in this case; x , the width of base, therefore, will be

$$= \sqrt{\frac{3 \times 18,000}{112 \times 12}} = 6.3 \text{ ft.} = 6 \text{ ft. } 4 \text{ in.}$$

In practice the stability of the wall would be ensured by adding considerably to its thickness. It might be made 8 ft. thick at bottom and 4 ft. at top, as in Fig. 7, which would about double its weight and make its resistance about $2\frac{1}{2}$ times the moment of force against it.

The weight of the wall would be its height, = 12 ft., multiplied into its mean thickness, = 6 ft., and into 112, which would amount to 8,064 lb. The leverage with which this weight would act to prevent its being overturned would be, as before, the horizontal distance of the fulcrum, from the vertical line passing through the centre of gravity. The centre of gravity of a trapezoid, such as the section of the wall in Fig. 7, is found thus: draw a line from the middle of the bottom of the wall to the middle of the top. Call the thickness of the wall at the bottom, T , and the thickness at the top, t , then the height of the centre of gravity above the bottom, measured along the line that joins the centres of the top and bottom, will be half the length of that line multiplied into

$$1 - \frac{1}{3} \text{ of } \frac{T - t}{T + t},$$

and in this example it is, but first find the length of the line thus: it inclines from the vertical 2 ft. in the height of 12 ft.; it is therefore the hypotenuse of a triangle, the sides of which are 12 ft. and 2 ft.; it is, therefore =

$$\sqrt{12^2 + 2^2} = \sqrt{148} = 12.16 \text{ ft.}$$

The distance from the bottom, therefore, is

$$6.08 \times \left(1 - \frac{1}{3} \text{ of } \frac{8 - 4}{8 + 4}\right) = 6.08 \times$$

$$1 - \frac{1}{3} \text{ of } \frac{1}{3}, \text{ or } \frac{1}{9}, = 6.08 \times \frac{8}{9} = 5.4 \text{ ft.}$$

The position of the centre of gravity of the wall having been found, it is now required to know what is the horizontal distance from the fulcrum, or toe of the wall, to a vertical line drawn through the centre of gravity of the wall. The deviation from the vertical of the slant line that divides the wall down the middle is 2 ft. in its whole length of 12.16 ft.; the proportionate deviation, therefore, of the length, 5.4 ft., is .89 ft. If this distance be added to half the length of the wall at the bottom, the sum will be the distance required. In this case that distance is 4.89 ft., and is the leverage with which the weight of the wall acts to resist its overturning. The weight of the wall is

$$12 \times \frac{8 + 4}{2} \times 112 = 8,064 \text{ lb.}$$

which, multiplied into leverage of 4.89 ft. = 39,433 lb., the moment of resistance of the wall, opposed to the moment of force, tending to overturn it, of 18,000 lb., which is, as we said before, about, but not quite, $2\frac{1}{2}$ times that force, and such a wall may be regarded as having sufficient stability, with this margin of resistance over the pressure against it.

THE PROPOSED THAMES SEWERAGE COMMISSION.

IN connection with the remarks we made a fortnight ago on Mr. Bazalgette's comprehensive scheme of drainage of the towns in the Thames valley, it may be well to examine the position a little further. The intention to separate the whole of the rainfall from the sewers that are to convey the sewage into the proposed new main sewers is the chief point for consideration. Hitherto it has been usual to provide that the intercepting or outfall sewers shall be capable of carrying off a portion of the rainfall, leaving excessive quantities to flow into the rivers or other natural watercourses through storm outlets. Sewers that convey the rainfall, in addition to the sewage, to such points as are suitable for the

construction of storm overflows, must always be of sufficient size and inclination to carry off large quantities of water. An inch in depth in an hour over the area of the town drained directly into the sewers has often been adopted as the proper quantity to be provided for; although as much as 2 inches in depth have fallen in an hour, and in a few exceptional cases even more than that, but 1 inch in an hour has been more often calculated upon. This requires a considerable capacity of sewer, but in point of size not so large a one as it had been customary to construct before sewerage became better understood after the long and severe discussions that followed on the propositions of the General Board of Health to lay down excessively small pipes.

Engineers other than those directly employed by the Board of Health refused to acknowledge the truth of the assertion of the Board that the practice founded on the experiments and investigations in hydraulics that had been made by Du Buat, Eytelwein, Prony, and others, was wrong, and that a small glazed pipe would carry off a very much larger quantity of water or sewage than those experiments warranted, and accordingly they continued to design sewers on the theory of hydraulics generally accepted, but on the question of what quantity of rainfall should be provided for in addition to the sewage they exercised individual judgment, but there was never much disagreement among them that an inch in an hour ought to be provided for. Sewers at that time, both large and small, were made to discharge their contents directly into the nearest river or stream for the most part, although in some instances settling tanks were interposed between the outfall of the sewers and the river, in order to prevent the silting up of the channel and to preserve the solid parts of the sewage for manure; but it could never be sold for anything like what it was expected to be worth, a very few shillings only per ton having been obtained for it, hardly enough to cover the cost of throwing it out of the tanks, mixing the street sweepings and other rubbish with it, and loading it into carts; the reason of it all being that the really valuable parts of the sewage, those which go to fertilise the land, reside in the liquid in solution, and cannot be precipitated except by expensive chemical operations.

Sewage can be made clear to the eye by the use of the milk of lime, which is not an expensive operation, but the essence of the sewage still remains in the liquid. Had this process been more generally adopted the discovery that the rivers were being polluted with town sewage might have been much longer delayed; but Local Boards, Town Councils, and other town authorities did not trouble themselves to go even to this extent in preventing the pollution of the rivers, but continued to discharge the whole contents of the sewers into them until it became an obvious nuisance and a crying evil.

Perhaps it is as well in the end that they did not adopt this partial remedy, for it would not have had the effect of really rendering the sewage pure enough for admission into rivers, besides having the effect of diverting from the land valuable fertilising matter, of which it is being deprived every time a crop is removed from it.

Since this discharge of sewage into rivers has become intolerable, and has, indeed, in the case of the Thames, been prohibited by law, the sewage, together with whatever quantity of rainfall may flow with it, is required to be diverted from its direct course to the river, and the liquid is ordered to be purified before its admission to the river. This purification is recommended by the Rivers Pollution Commission to be effected by the irrigation of land where practicable, or by intermittent downward filtration where that is not so. In either case, in low-lying towns in valleys, land cannot be had which lies at a sufficiently low level to admit of the

sewage flowing on to it by gravitation, and it must be pumped by steam or other power, and in such cases it is a matter of importance to limit the quantity as much as possible. This necessitates the exclusion of excessive quantities of rainwater, and the manner in which that has been done is to consider first, as Mr. Bazalgette did when designing the intercepting sewers of the metropolis, what quantity of rainfall will be a reasonable quantity to be dealt with when the sewage is to be pumped, leaving storm waters to flow into the river as before. This he established at $\frac{1}{2}$ in. in depth in twenty-four hours; half of which, according to experiments on the actual flow in the sewers as compared with the quantity due to given depths of rainfall, it was found would find its way into the sewers, the remainder being absorbed or evaporated. In the year 1865 Mr. Bazalgette read a paper at the Institution of Civil Engineers on the main drainage of London, on which occasion he said that the question how to dispose of the rainfall was a question of considerable difficulty, and had given rise to much difference of opinion. This arose from the fact that, whilst it is in itself harmless, and even advantageous to the river, it sometimes falls suddenly in large quantities. "These considerations have induced theorists to advocate that the rainfall should not be allowed to flow off with the sewage, but should be dealt with by a separate system of sewers. This theory is, however, most impracticable. It would involve a double set of drains to every house, and the construction and maintenance of a second series of sewers to every street. Applied to London it would involve the re-draining of every house and every street in the metropolis; and, according to a moderate estimate, it would lead to an expenditure of from ten to twelve millions of money, while the interference with private property would alone render such a proposition intolerable.

"Careful observations of the quantity of rain falling on the metropolis within short periods had been made by him for many years. Taking an average of several years, it had been ascertained that there are about 155 days per annum on which rain falls; of these there are only about 25 upon which the quantity exceeds $\frac{1}{2}$ in. in depth in twenty-four hours. Of such rainfalls a large proportion is evaporated or absorbed, and either does not pass through the sewers or does not reach them until long after the rain has ceased." After having referred to a report by Mr. Bidder, Mr. Hawksley, and himself, made in the year 1858, in which it is stated that, as a rule of averages, $\frac{1}{2}$ in. of rainfall will not contribute more than $\frac{1}{2}$ in. to the sewers, he went on to say that, allowing for the abstraction due to evaporation and absorption, it is probable that if the sewers are made capable of carrying off a volume equal to a rainfall of $\frac{1}{2}$ in. per day during the period of maximum flow of the sewage, which ranges over about six hours of each day, there would not be more than twelve days in a year on which the sewers would be overcharged, and then only for short periods during those days. Recognising, then, that exceptional rainstorms must be provided for, however rare their occurrence, he had provided overflow weirs to act as safety-valves in times of storm, at the junctions of the intercepting sewers with the main valley lines. On such occasions the surplus waters would be largely diluted, and, after the intercepting sewers were filled, would flow over the weirs and through their original channels into the Thames.

We do not, in considering the merits of the present scheme, make a point of objection by this reference to what was Mr. Bazalgette's opinion of a double system of drainage at that time, because the whole thing had reference to London only, and there are many circumstances to be taken into consideration in the case of London that do not occur in some country towns, or at most only to small parts of them. The traffic

in London is so much greater as to render the washings from the roads as impure as sewage itself, and therefore, in the case of London, inadmissible into the river, and a greater proportion of the area is closely built upon, rendering the introduction of a double set of drains to the backs of the houses still more difficult than it would be in the country towns; therefore, we do not at all say that Mr. Bazalgette may not consistently hold the opinion that the separate system is proper now for the towns he now proposes to deal with, but we refer to the statement merely because it is made in particularly strong terms both as to inconvenience and cost.

A moderate estimate was from ten to twelve millions of money for a population of from two-and-a-half to three millions of people, or at the rate of £4 per head of the population. This may be—indeed, certainly is—more than the same work would cost in country towns, but we must defer to another occasion the consideration of this and a few more points of the scheme.

DILAPIDATIONS.—VIII.

LAW.

ACTIONS.

HAVING in preceding chapters explained how the surveyor prepares to enforce his client's rights, I now come to the next stage. The solicitor prepares his declaration, and with that the surveyor has little to do. To show how carefully it must be drawn, I would mention that where the covenant was to repair, casualties by fire excepted, and the declaration set it out as a general covenant to repair, omitting the exception, the omission was held fatal upon *non est factum*, although no casualty by fire had in fact happened (cases: *Brown v. Knill*, *Tempany v. Burnand*); and, again, where there are the two covenants to repair (these I have explained in "Covenants," number 19), one being to repair generally and the other within a certain time after notice, they must not be mixed up in the same breach, but must have assigned two separate and distinct breaches, one to each, or the declaration will be bad on *demurrer*. Having regard to all these legal difficulties, I strongly recommend you to try all in your power to induce the person liable to comply with the covenants; still, no doubt, cases will arise when only the strong arm of the law will have any effect. The defendant after declaration, does, what is called, pleads; his plea usually taking something of this form, that the house or premises was not out of good and substantial repair. Then comes the question of evidence; and you will have, if engaged on behalf of the plaintiff, to prove the state of the premises, so as to show that they were out of repair at the date of writ, and that the covenant to repair in the lease (and which is recited in the declaration) was broken.

To explain what amounts to a breach of covenant, I quote the following from the legal writers, who state:—"What defects in the state of repair of the premises amount to a breach of the covenant must in all cases depend upon the manner in which the covenant is worded, considered also with reference to the nature of the premises. It is not sufficient that the tenant keep the premises in as good a state as they were in when they were let to him; but if his agreement be to keep them in good repair he must do so with reference to the class to which the premises belong." Reader, remember this, as it is the basis of all actions, and guides the decision of the jury or referee. Well, the day of trial comes, and you will now realise the value of my advice given in Part V., for no easy task may await you, and it will be some assistance to be able to turn to any item at once, when counsel asks you, instead of fumbling page after page unsuccessfully, and so getting hot and fidgetty yourself, and annoying counsel, judge, and

jury. The latter will think you are not to be trusted, if you cannot answer at once. Your conduct in that all-trying position, the witness-box, must much depend on temperament, experience, and confidence in the knowledge of your subject. That honesty of intention alone will not avail you, I might recall to your memory that almost incomparable scene in court in "Pickwick," where the great Charles Dickens shows in the character of Mr. Winkle the absolute failure of good intentions. One hint only can be given to assist. Take most carefully your dilapidations, write them plainly, so that you can easily read them, and study your case laboriously, so that you become its master, and then, and then only, you may hold your own against the most severe cross-examiner of the 'wig and gown.'

Bearing on this point the *Saturday Review* in a clever article in a recent issue, headed "Historic Doubts," says:—"It is always so easy to believe what one has an interest in believing, or is desirous from any other motive to believe, that it is seldom the temptation is thoroughly resisted, though the yielding to it may be quite innocent and unconscious. In nine cases out of ten the lawyer is convinced of the justice of his brief, and the expert has a clear conscience in giving his evidence for the side which retains his services." I do not think the writer has sufficiently considered that surveyors and other technical witnesses are so frequently engaged on one side and the other of the question; that his remarks will scarcely apply. I do not think we can unconsciously deceive ourselves.

If you have a case where the term has expired, and you are claiming for the loss of the use of premises, while the dilapidations are being made good, estimate the loss of the premises by the rental similar premises in the same locality are obtaining. In arriving at the money value of dilapidations, you base your estimate on the sum it would take to put the premises into that state of repair in which they should have been left to fulfil the covenants. It is often the case to call in builders to confirm, their evidence being that they would do the works you specify as necessary; for a certain sum. Your evidence should be supported by three or four surveyors, who are often called a *team*; the importance and difficulty of the case much, however, guiding the number. Next we have to assume you are acting for the defendant (lessee or other person liable), then your duty will be, if you find there is no defence, to advise your client to ask for time, in which event you will generally find that on payment of costs incurred through the default of your clients, an extension of the time will be given. It will be as well, if you can, to agree upon a specification of works to be done, as this will save any dispute as to the *quantity* of works which should have been done, when the next visit of lessor's surveyor takes place.

It is so important to remember who can bring, or rather who can maintain actions for dilapidations (because any one can bring an action) that I would again use the tabulated form.

TABLE 24.

1. The heir may, although the lessee have only covenanted with the lessor, his executors, and administrators.

2. The lessor and his assignee.

The reason of this is that the covenants to repair run with the land, and are binding as well on the parties covenanting as on the assignee of his interest, and may be taken advantage of by the assignee of the reversion as well as by the lessor himself. There are eight cases in support of this mentioned by *Grady*.

3. The assignee of the reversion; but he is limited to such breaches as have occurred after he has purchased.

4. The assignee of part of the reversion.

5. The executors and administrators of the party originally having right to sue.

The executor is not limited, but may sue for a covenant broken in the lifetime of the testator,

although the covenant runs with the land. The executor of tenant for life also may sue for breach of covenant committed in lifetime of the testator. Executors or administrators of any person deceased may maintain actions of trespass or case for any injury to the real estate of such person committed in his lifetime, for which an action might have been maintained by such person, provided such injury shall have been committed within six calendar months before the death, and that such action shall be brought within one year after the death.

6. The lessor may, where the demise is not under seal, and where, consequently, the right to sue on an agreement to repair does not pass to the assignee of the lessor, then notwithstanding the assignment the lessor may.

Those against whom actions may be maintained are

TABLE 25.

1. An heir.
2. The assignee of the lessee.

And also his executor or administrator, even although the assignee be not mentioned in the deed.

The assignee of a lease is liable for breach of covenant to repair committed during his own possession, though he may have assigned the premises before the action was brought. He is not liable directly to the lessor except for such dilapidations as occur from the period the premises were assigned to him, until the period he again, with *bona fides*, assigns them to some one else. He is not liable on a covenant by the lessee to do a specific thing within a given time, if the covenant is broken before the assignment. It is well, however, to remark that the covenant cannot so easily be got rid of, because in nearly all assignments there is the covenant to hold harmless from all the covenants the lessee or assignor. It therefore follows that though the assignee may not be directly liable to the lessor, he is usually liable to an action by the lessee or the assignor to him.

3. The lessee, who is always directly liable to lessor, and does not and cannot get rid of such liability by assignment, as the assignee may, which we have just explained.

4. The executor, but his liability commences only from the time he becomes interested.

5. Executors or administrators, actions of trespass, or case, for any wrong committed by the deceased in his lifetime, the time, however, being limited.

NOTE.—An underlessee cannot be sued in covenant or debt on the original lease: the reason being that there is no privity of estate between him and the grantor.

WAIVER.

As surveyors are nearly always appointed receivers of estates by the Court of Chancery, and by those who have large properties and wish them well managed, it behoves our profession to take great care that in the ordinary course of taking the rents they do not stultify any proceedings the solicitors may have taken.

The receipt of rent, for instance, while an action for ejectment is pending, will much complicate the case and add to the difficulty of obtaining a successful verdict; although it would appear it will not amount to a waiver: unless it can be shown it was so intended.

An example I may quote of a son who collected rents for his father, who was too ill to attend to business, it not appearing that the son knew of the forfeiture, has no authority to waive it.

Giving more time than the usual three months' notice is not a waiver.

Waiver of Forfeiture.—Can of course be repaired at by putting the premises in repair in accordance with the covenants.

But if action brought, putting the premises afterwards into the most thorough repair required by the covenants will be no answer to the action. Nor will the Court of Equity afford any relief.

Where the two covenants to repair occur and notice is given under one, it is no waiver of the other (the general) covenant, and an action may be brought while the notice is running.

It is a waiver where the landlord, under a special covenant, gave notice that he should enter and do the repairs and distrain for the expenses.

Where the lessor acted so as to induce the assignee of the tenant, against whom the action was brought, to believe that he was

doing all that he ought, it acted as a waiver, and the lessor did not recover although the covenants were actually broken.

The following may well be cited as showing a curious decision where a waiver really was given without the landlord's consent or knowledge. There was a treaty for the sale of the premises, and the proposed purchasers absolved the tenant from repairing, and the Court thought that, although there was no waiver by the landlord, yet that the neglect of the tenant was, under the circumstances, so excusable, that he was entitled to relief. It was, no doubt, one of those "hard cases" which, to use the well-known expression, "make bad law."

INJUNCTIONS

Can only be obtained where there is an apparent intention on the part of the tenant to do some irreparable injury to the premises; for example, it will restrain tenant from altering the premises, if such alterations be disagreeable to those who have a permanent interest in them, although the alterations may improve and beautify the property. Again, the Court will restrain a tenant from pulling down a house and building another, should it be objected to, by the landlord. Again, injunction can be obtained to restrain a tenant from committing an act contrary to his own covenant, even though it be not waste. Injunctions will also be granted to restrain the doing of certain acts, which the tenant claims a right to do, until by an action at law such right has been tried.

It should be borne in mind it is not necessary that the action should be commenced before the application is made to the Court, a mere threat will sometimes be quite sufficient. In one case the sending a Sawyer to mark trees was held sufficient. *Injunctions will be granted* to all persons whose interest would be prejudiced by the commission of the acts, provided of course they can show serious injury. It is not necessary, therefore to show *privity of estate*.

CONCLUSION.

Having carefully considered every part of the subject, and shown that DILAPIDATIONS are voluntary, or permissive, and that in legal consideration (as Mr. Grady expresses it) they are either a wrongful act or misfeasance, and an injury to the reversionary estate, or merely a breach of contract; and that in the former case, the remedy would be by an action on the case in the nature of waste for the injury done to the reversion; and in the latter case the remedies are various, according to the nature of the contract between the parties. The forms of action comprise assumpsit, covenant, contract, debt (where covenant secured by a bond), ejectment, and injunction.

That these varied forms of action give the injured person plenty of opportunities for obtaining redress no one will doubt; but still, where those liable can be induced to meet their liability fairly, my advice is, avoid law.

A few words in conclusion. It is astonishing how soon one's pursuits cling to one. I recollect, some years since, making a walking tour, knapsack on shoulder, thick stick in hand, with a friend, and having walked a long distance we came upon one of those lovely bits of scenery which are so glorious and entralling, probably because they are so suddenly met with. We stood enraptured—the grand bay; the sloping cliff, with the pretty cottages nestling amongst the trees; beyond, the blue sea with the white sails of the ships. How the charm was broken by my waggish friend, saying: "Replace defective chimney-pots; point open joints of chimney shafts!" That the pursuit of this dry subject is opposed to picturesqueness is clear: it is the very antithesis. Imagine a surveyor taking dilapidations in such a scene as the following, which I extract from that well-known book, "Dr. Syntax's Tour in Search of the Picturesque:"—

"Beneath that archway once a gate,
With helmet crest in warlike state,
The bands marched forth, nor feared the toil
Of bloody war that gave the spoil.

* * * * *

But now, alas, no more remains
Than will reward the painter's pains:
The palace of the feudal victor
Now serves for naught but for a picture."

No. The surveyor must cast aside the love of lichen, crumbling walls, dilapidated thatch, overhanging chimneys, broken gates, untrimmed roofs, when in pursuit of his duty, and he will find these pages a very useful reference. That such reference to some standard is thought necessary, even in the fashionable world, I would quote an amusing passage from Mrs. Edwards's latest work:—"Alfred Hervey," observes Mrs. Crosbie suavely, "is a man of the world, my dear Emma. Alfred knows the value of etiquette, as Rawdon will have to learn it in time. My dear, dear old uncle, your god-papa, sir, Canon Hervey, used to say that good manners are the small change of good morals. 'In our transitory state we have not time, we have not wisdom,' the venerable man used to say, 'to decide, on the spur of the moment, whether any intended action be intrinsically right. We can always say to ourselves, is it usual for persons moving in a certain refined sphere of life to do so-and-so? And we shall rarely, if ever, find ourselves misled in the result.'"

Surely, if time is so limited that *authority* is wanted to guide the fashionable world, how much more must it be required for those pursuing our arduous profession?

Such an *AUTHORITY* I have endeavoured to make the foregoing pages on this important subject.

BANISTER FLETCHER.

ANSWERS TO QUESTIONS.

Q.—Is it a dilapidation if the paving stones of an area are in several places broken in smaller pieces, or cracked across, but still all in place, and bonded with mortar or cement?

A.—It is a dilapidation, and my correspondent will find the reasons fully given in paragraph 7, Part 5.

Q.—Under a yearly tenancy, after a tenant has been in a house several years, is he liable for papering of a room being slightly torn, or would that come under wear and tear? If not, what does tear mean? If liable must he paper all the room or patch the injured part?

A.—As to the first part of the question, he is clearly liable for the torn paper, as it would not be "wear and tear"—"wear and tear" being usage, and not damage; perhaps I cannot better explain this to my correspondent than by mentioning as an illustration the case of machinery, where "wear and tear" would palpably be the natural wear for its use in motion; breakages and other injuries would be dilapidations. As to the second part of the question, undoubtedly he must paper the entire room if he cannot match the pattern of the paper with which the room is papered.

Q.—If he (lessee) makes a long splinter on a grained skirting, may he mend and touch up, or must he paint and grain skirting all round the room?

A.—Only mend and touch up, but it must be done efficiently.

Q.—Is lessee liable to reinstate if bad settlement of house (owing to insecure foundation) has caused a fracture of the walls?

A.—Yes.

Q.—If partitions and floors are sunken?

A.—Must be reinstated if caused by neglect of the lessee.

Q.—If party wall bulged or otherwise dilapidated, is lessee liable to reinstate? If so, can he compel adjoining owner to contribute his share of expense towards so doing?

A.—The fact of its being a party wall makes no difference; the same liability attaches as would to an external, or any wall. As to the second part of the question, adjoining owner is liable to contribute.

Q.—Am I correct in believing that additions to tenements, which may be made by lessee during his holding, are brought within repairing clauses of lease or agreement, if no other stipulation thereon respecting such erection or addition?

A.—Certainly you are correct. The covenants would apply unless the additions were so erected as not to become part of the freehold. In this latter case they would be lessee's fixtures; and he could remove them before expiry of lease.

Q.—Where a tenant is bound by agreement to leave house in "tenantable repair," what does that imply? Does it mean *fresh* paper, ceilings to be whitewashed *anew*, &c., and does it infer any substantial repairs?

A.—The writer of this question will do well to read "Covenants, their construction and accepted meaning," Nos. 3, 5, and 8. He will there see that the covenant must be read having regard to the original state of the house, and may be taken that the house should be left in fair order, but not, certainly, that at the end of the tenancy the house shall be fresh papered, and ceilings fresh whitened. It does require such substantial repairs as are necessary to keep the house wind and water-tight, so that the premises may be kept in fair condition.

Q.—If a yearly tenant complains to landlord of want of repairs, landlord neglects, and damage ensues, which party is liable for the damage?

A.—If no written agreement whereby landlord is bound to repair, then tenant must put up with the loss. My correspondent will see in Table 1, No. 1, that there is no liability on the part of landlord to repair; so that it necessarily would follow that he cannot be liable for any injury arising from his omission to do that which he need not do. He is not legally liable at all.

Q.—Under a yearly tenancy if external rain water-pipe from roof gets choked or corroded, and the water leaks through wall, damaging the internal plastering, who is liable?

A.—The tenant would be liable in strict law, but I do not believe it could be enforced. If the injury were sustained in London, the *custom*, I think, might be pleaded, which is against requiring yearly tenants to repair roofs.

Q.—Am I correct in understanding you to mean that when a tenant continues after the expiration of his lease, he does so under all the covenants thereof?

A.—You are nearly correct in so understanding me. The law is most certain on this point; he holds over, liable to all the covenants of his expired lease, which, however, are to be construed more mildly, on account of the absence of certainty in his remaining—see Table 2, paragraph No. 13. For example, suppose seven years to have passed by since lease expired; and that if lease existed the whole internal painting would be due, and further, suppose landlord had given notice to determine the tenancy, it would be *hard* on the tenant that he should be turned out, and still be charged with the entire painting of the house, unless in his lease were the covenant (which is somewhat unusual) that the house shall be painted inside in the *last* year of the term. In this latter case, as he would not be damnified in any way, he would be liable for the *whole* of the painting.

Q.—If carving in stone or wood be decayed, is lessee bound to cut out block and make good as before?

A.—Yes, see Table 17; the last paragraph shows the cheapest way of doing this that is permitted.

Q.—If paving in yard put down by lessee during holding (where none before), and same be broken or otherwise defective, is he bound to reinstate?

A.—Certainly he is.

Q.—If tenant served with usual notice to repair within three months, and he agrees to do all repairs, &c., to satisfaction of landlord's

surveyor, is said landlord compelled by law to supply tenant with schedule of dilapidations?

A.—No; and the reason is obvious. The lessee or person liable to repair is supposed to understand the liability he has assumed, just as every Englishman is presumed to know the laws under which he lives, and no doubt the one case is as much a *fiction* as the other. Therefore, the wise man, on receiving the notice would at once consult his own surveyor, and so in the end save money and trouble.

Q.—If basement flooring and joists rotted, through damp arising from nature of soil, is lessee liable?

A.—Yes.

Q.—Presuming lessee has signed agreement for lease with usual repairing covenants, and two days after taking possession the roof falls in owing to defective state of timbers, is lessee bound to reinstate, when it can be clearly shown that such dilapidation existed previous to his signing agreement?

A.—Yes. The liability accrues from the execution of the instrument. This is the reason why it is so necessary, when about taking the house on lease, to have a surveyor to inspect the state of premises.

Q.—Under a covenant to well and tenantably repair, without any express obligation to paint, is a lessee bound to paint?

A.—Yes; see Table 20, in Part 6, where liability is fully explained.

Thanks to my correspondents, one of whom says, "Your tables are very pithy, and to the point." B. F.

MODERN HOUSE DRAINAGE, LIQUID AND GASEOUS.

THE urgent importance of improved sanitary provision, in connection especially with our house drainage and the ventilation of our sewers, has within the last few weeks been painfully and pressingly manifested. The *Lancet* Commissioners have shown what they believe to be a probable cause for the severe fever which has attacked the Prince of Wales and others—namely, the defective drainage and water supply of Sandringham and Londresborough Lodge. The *Times* also has taken the subject up very warmly; but it may be asked what constitutes the peculiarity in respect to the drainage of these places? Are not all modern dwelling-houses subject to similar arrangements, more or less? And if they are, is not the system wrong which provides such plans of drainage? The writer of this paper is fully sensible of the difficulties which beset any new or improved scheme or invention, and the prejudices existing among manufacturers and others are often too strong and unflinching to admit anything that appears to compromise or upset existing appliances. Then there are the mysteries or habits of crafts which artisans, tradesmen as well, and many professional men, are unwilling to have disturbed. These influences steadily and obstinately oppose any radical change or new idea. Notwithstanding such hindrances, science must assert supremacy, and the appliances of art become modified thereto, despite mere empirical knowledge and prejudice. No better proof of this unwilling submission to facts and natural laws can be afforded than in the particular branch of art under notice. The improvements made upon the primitive idea of drainage, and the construction of closet apparatus, have been by very tardy steps, the main evils remaining untouched. Ingenuity has been taxed and mis-spent upon points of constructive detail, such as regulating the water supply, flushing apparatuses, valves, &c., and much labour has been somewhat thrown away upon endeavouring to produce noiseless action. However meritorious these inventions or improvements are in themselves, they still leave the fundamental source of mischief, from a

notion founded upon mercenary considerations, that improvements in detail, or in some little matter, may induce a ready sale at small outlay, or that people will not care to adopt an entirely new thing or novel principle. This is really the bane of and obstructive to all inventive effort, improvers on patents generally reaping all the benefits.

Such little improvements, then, are frivolous compared with the primary laws which should govern our system of drainage; indeed, what we require is to convert or employ the laws of Nature to our own advantage by making our own contrivances subserve them. Just taking our present sewerage system as an example: we have been throwing away our excrementary matter in a most irrational manner, and instead of making it the agent of fertilising our soil, we are allowing it to pollute our fairest streams, or contaminate our noblest highways of commerce with the germs of disease and death. We are, in fact, putting Nature's laws at direct variance or making them deadly in their operation to ourselves. Again, what are cesspools but receptacles of corruption of the deadliest form in our midst, whose loathsome emanations are constantly vitiating the fountain of life and health? It is true we are now discovering our folly, and trying to dispose in a reasonable way of such matter; but while we are discussing the best means of discharging and employing our solid sewage at the outfalls, we are thoughtlessly—madly—allowing the most insidious, subtlest part of the poison, or the gaseous form of it, to enter unchecked our very dwellings. By their connection with the soil-pipes they become the extractors of and receptacles for the sewage gases; and no reservoir devised to receive these insidious enemies of life and health can answer the end better. One or two imperfect water traps are the only safeguards against the entrance of the deleterious gas, and these are too frequently worthless, either on account of an undue force of the ascending gas, or because of the thin layer of water that supervenes in the traps. In dealing with a remedy for the existing evil, the question arises, can we dispense with the evil altogether by removing the source of it? This may be done. 1st. By dispensing with indoor closets altogether. 2nd. By using earth closets. 3rd. By adopting some means of cutting off or disconnecting the injurious means of the connection of the sewage effluvia and the house through the soil-pipe. The impracticability of adopting either of the former plans in a large town under present arrangements is too obvious to require attention. The remedy must be applicable, if possible, to existing houses, to be of any great immediate value. The disconnection of the closet or sink and sewer in any manner to prevent the sewage gases, always light and therefore ascending, from entering the house, is the problem to be solved. This may practically be effected by vent-shafts or air-pipes carried from the highest points of the traps or soil-pipes, either through a fire-flue or at the side of one above the roofs, so that the gaseous products should be carried away innocuously. The provision for the gaseous matter is not dreamt of in our present unsanitary system; the gases are thus virtually compelled to escape through any unguarded channel or inefficient trap whenever the descent of the solid matter or the downward rush of water compresses it or displaces its natural volume. Ordinarily, such safety-room or vents may be served by the length of soil-pipe; but wherever this gas is incompressible, by reason of the limited capacity of the drains or pipes, the traps are useless, and the gas finds its liberty through our closet-pans or up our sinks. Not only should the closets of every house be provided with a vent tube of sufficient size, but the same provision should in all cases be made at the entrance to the sewer, or the sewer itself be ventilated at proper intervals by lofty shafts, so that the escape of this gas may be rendered easy under peculiar

pressures or conditions, and at the same time relieve other houses. In the country, where cesspools are used, they should have such tubes carried up from them at the side of trunks of trees, &c. By this plan the descent of the drainage matter from the house could not be checked by the sewage gas, the latter being driven before it, instead of finding a passage through the descending or out-running matter. There is a difficulty often in carrying a vent or air tube up a chimney, as fire flues are not often near water-closets. In these cases it would be better to place the soil-pipes outside the house if possible, its highest point being ventilated in the above manner, in a line continuous with it, the closet trap inlet being introduced through an intermediate trough exposed to the air. By this means the ascending sewage gas would naturally take its straightest upward course, the closet matter and flushing of every action of the water-valve helping to drive the gas up its appointed channel, instead of through an imperfect water-trap. It is manifest the ordinary soil-pipe connection with the trap provides only for one condition, the outlet of the matter, and every time this takes place a portion of gas is forced aside or comes into collision, instead of having another and distinct passage provided. By the means here proposed, or a similar arrangement (by which the closet matter and gas are both provided for without interfering with each other), the author thinks all new closets, and even the old ones, may be constructed free from the errors that have lately been illustrated with such import. It should be known that all gases are expansible, capable of great force, while their compressibility is considerably greater than that of liquids; these properties, together with the fact that all gases rise by virtue of their density compared with air, and also that heat expands them and increases their elastic force and lightness, indicate the absurdity of supposing sewage gas will be kept within limits by 2in. or 3in. of water, and in a lower temperature than our houses; and really our iron gratings to our cesspools and entrances to our sewers are so many points of ingress for the cold air to enter and force the gases into our heated chambers. All proposed sewer ventilation that does not take this simple natural law of pneumatics into account are worthless. A member of the medical profession writing to the author says: "The main sewers should on no account have those objectionable and offensive open gratings adopted in many places in towns, which cannot be sufficiently condemned, for though it may be urged that the offensive gas passes off in such small quantities and is so readily diffused that it can scarcely be considered injurious, this is a fallacy, as any portion of it is injurious, and demands that it should be wholly removed to the region of the air where it can do no harm." The same scientific authority, Dr. H. Clark, F.S.A., of Russell-square, further says, in reference to house drainage: "The use of vent-tubes is no new idea, but they promise adequate security against upward pressure of the gas, the drains being well trapped in all other respects, 1st, by having a deep water trap at the outlet and close valves to the closets; these, as they now exist, have generally a very imperfect water-valve, easily overcome by any accidental upward pressure, and the pan, having usually a side tube to allow any overflow of water to pass away through the perforation at the upper part of the pan, afford also a free ingress of gaseous matter when the pressure is sufficient to overcome the water in the bend of the pan shaft." Instead of the loose pan or dish at the bottom of the ordinary pans, this writer recommends an accurately-fitting flap to retain sufficient water above it; a similar expedient is recommended in regard to waste-pipes, which should have metal valves at their inlets to soil-pipes, these valves being counterpoised and holding just sufficient water to keep the

effluvia back when closed. It, cannot be supposed that a thin layer of water in a trap can effectually prevent noxious smells from entering a house, for liquids absorb gases, and the water in our closet and drain-traps are often saturated with the poisonous gas to such an extent that the air becomes contaminated by it. This is another reason why an improved sort of trap or valve is imperatively required in the existing arrangements.

The whole of the arrangements suggested in the present paper are based on simple natural laws, the principal one being that sewer air is lighter than common air; that by virtue of this lightness, increased by warm rooms, the cold drains empty their gaseous products into our houses; and that the reversal of this state can only be attained by allowing cold and heavier air to enter the soil-pipes at convenient places before they enter our houses, unless a draught can be established up some powerful extractor to higher and harmless regions of the atmosphere, where this sewer air can expend itself.

The writer hopes these remarks will stimulate the profession to study the sanitary principles of house drainage more than they do, leaving defunct and obsolete sciences such as archæology to more leisurely moments, and giving their attention to branches of their calling which imperatively demand all the facts and knowledge which modern science and their own observation can give.

G. H. G.

NEW MARKETS.

THE New Foreign Cattle Market for London, built on the site of the old Royal Dockyard at Deptford, will be formally opened by the Lord Mayor on Thursday next. The area of the market ground contains 28 acres 5 poles. The six covered ship-building slips in the yard have been utilised for the market purposes, and joined together by ranges of buildings covered with bound roofs in three bays. They are about 155 feet wide and 15 feet high to the wall-heads. They are lighted by storm windows, glazed louvre-wise, with sloping slabs of strong, rough plate-glass, with ample space for ventilation. The slips vary in size, but make very airy cattle-sheds. One of them, with a fine iron roof on cast-iron pillars, is 400ft. long, and is an imposing structure. This and others of the slips are so fitted up that the live stock they contain may, if landed in a diseased condition, or in the event of disease breaking out among them, be completely separated and slaughtered without being brought into contact with the cattle in other parts of the market. On an allowance of 30 feet superficial for each head of cattle, and 5 feet superficial for sheep, there is provision made for 3,892 cattle, and 11,510 sheep, all in lairs and pens, roofed and closed in. The cattle have wooden mangers along the heads of their pens, and water-troughs extending also from side to side. The sheep pens have iron feeding-racks sloping downwards on the sides and ends from the top to the bottom. These racks are raised and lowered by cords and pulleys suspended from cross spars overhead. The sheep pens are also provided with water-troughs. For landing the beasts from the steam vessels three wooden jetties have been erected. They project about 200 feet into the river, which has been dredged so as to give the vessels at the front about 15 feet depth at low water. The front of the jetty is 100 feet long, and has a roadway from each end that inclines inwards until the two meet each other in a triangular form at about 100 feet from the quay. The lower landing stages are reached by hinged gangways with bars across them to give foothold. Ample slaughter-houses are provided, fitted with all the best mechanical and other contrivances for the use to which they are to be applied. The works have been executed for the Corporation of London under the direction of Mr. Horace Jones, F.R.I.B.A., City Architect, Messrs. Browne & Robinson being the contractors. The total cost, including jetties, is £105,000.

The Bradford Covered Market is fast progressing towards completion. The works were let in December, 1869, for the sum of £12,500, but this structure is only a part of the Kirkgate Market scheme, as it only extends from Kirkgate to the first opening in Darley-street; whereas the complete scheme provides for its being carried forward to Godwin-street above. Messrs. Lockwood & Mawson are the architects, their plans obtaining the first

prize offered by the corporation for market designs. The building is in the Italian style, the principal ornamentation being at the Kirkgate front, where is the main entrance to the building. The interior is arranged on the pavilion principle, and there are four avenues. It is 45ft. high, the roof being supported by light iron columns and arches, and so arranged that the northern light is principally admitted. There is ample provision for ventilation. Altogether the market will cost £20,000, exclusive of internal fittings; but as yet the Corporation have not entered into contracts for the erection of the second portion.

When the market scheme is completed there will be thirty exterior shops, eleven in Godwin-street, eleven in Dudley-street, and eight in Kirkgate. Ten of these shops are now in course of erection, and they will form the finishing of the Kirkgate front of the market. The contracts for building these shops were let in June last for the sum of £7,950. The covered market, according to the original terms of the contract, was to have been finished in March of the present year, but difficulties as to the delivery of the ironwork and other unforeseen circumstances have delayed the work. During the past few months, however, the progress of the various parts of the works has been more rapid, and workmen are now engaged in fixing the roof. In connection with the market—forming, in fact, a portion of the exterior buildings of the covered market—another block of buildings is fast approaching completion in Godwin-street. It is three stories in height, and has lofty attics. The block begins with the line of the street opposite the "Butter Cross," and extends to the line of James-street. The works for the erection of this block were let about fourteen months ago for the sum of £4,400.

MACCLESFIELD NEW COUNTY ASYLUM.

THIS very extensive establishment has now been opened for the reception of patients. The first sod was turned four years ago; the site being in a part of the suburbs—about a mile distant from the town—notable for its salubrity and the beauty of its scenery. The architect for the entire building is Mr. Griffiths, of Stafford. Some idea of the character and extent of the institution may be formed from the fact that the series of buildings of which it is comprised cover an area of $9\frac{1}{2}$ acres of land; the cost of the site and building will amount to about £131,000. The asylum is calculated to accommodate 700 patients. Its style of architecture is Italian, the materials used being red brick, with white and blue brick dressings, and stone enrichments for the clock tower, the principal entrance being underneath the tower. This entrance is approached by a roadway 16ft. wide from the principal lodge gates in Chester-road. Dr. Deas is the superintendent, and his house is the key to the entire building from the south side, as the clock-tower entrance is from the north side. The front from east to west is 912 feet in length. The extreme distance north and south is about 240ft. The buildings are divided by large airing spaces and recreation grounds. They consist of twelve complete blocks, and are united by one grand corridor 9ft. wide, running the whole length from east to west. There are four blocks giving accommodation for 113 each, two infirmaries for 68 each, two blocks for excited patients, 57 each, all detached and connected by corridors and single rooms; by this means proper classification is ensured, and the building being so subdivided, better light and ventilation is obtained than in the ordinary buildings of this class. All the patients' day-rooms are on the ground floor. The centre or administration block is for all purposes of management. The heart of the building comprises offices, surgeon's and matron's rooms, kitchens, dispensary, waiting and store-rooms, &c.; and to the south of these is the grand dining and recreation hall—the great feature of this part of the building. Its extreme length, including gallery, is 110ft., by 50ft. wide, and 50ft. from the floor line to the ceiling. The south end is fitted with platform or stage, in the front of which there is a handsome proscenium, available for concerts and other entertainments. On the male side is a block of buildings for tailors, shoemakers, upholsterers, cabinetmakers, carpenters, and plumbers; also a weaving shed, timber yard, and extensive brewery yard, in which occupation will be found for the patients, and on the females' side a corresponding building, consisting of washhouses, laundry, drying stoves, &c. At a rough calculation it is estimated that there is about a mile of corridors within the building, and there are also about 1,000 windows—sufficient light and means of ventilation having been paid especial attention to. The site, as well as the character of the building, is one which has offered many difficulties. The contractor for the execution of the whole of the work is

Mr. Henry Lovatt, of Wolverhampton; Mr. Mellard, of Rugeley, supplied the hot-water apparatus. The pumping engine was supplied by Messrs. Mellor & Son, of Rainow; the sewage engine by Messrs. Coupe & Co.; and the cooking apparatus by Messrs. Benham & Sons, Wigmore-street, London; and Mr. Westwood, of Dudley, was a sub-contractor for the slating; the Clerk of the Works was Mr. J. Laidlaw. The building is fitted with gas fixtures throughout, and provision against fire is made by one of Messrs. Merryweather & Son's hand engines and hose in each block. The church is situate at the western boundary, the chaplain being the Rev. J. A. Ladbroke, B.A. The style is the Early English Gothic, with nave and transepts, chancel, organ chamber, and vestry. The roof is open-timbered. The chancel and aisles are fitted with Milton's encaustic tiles, and the sittings are constructed of pine, and are capable of accommodating 430 worshippers.

CARVED SIDEBOARD.

HARRISON says "Drinke is vsuallie filled in pots, goblets, iugs, bols of siluer in noblemen's houses, also in fine Venice glass, of all forms, all of which, notwithstanding, are seldome set on the table, but each one, as necessitie vrgeth, calleth for a cup of such drinke as him listeth to haue, so that when he hath tasted of it he delivereth the cup againe to some one of the standers-by, who, making it cleane by pouring out the drinke that remaineth, restoreth it to the cup-board from whence he fetched the same. By this deuise much idle tippling is furthermore cut off."

Again in the Notes of Northumberland Household Book:—"Let no man fill beere or wine but the cup-board keeper, who must make choice of his glasses or cups for the company, and not serve them hand over head. He must know which for beere and which for wine, for it were a foul thing to mix them together."

Thus much for the "cup" or side-board of our forefathers. Moveable cupboards are "cabinets" now-a-days, or they find an asylum in the kitchen and offices. But their use when happily retained as sideboards remains the same, and truly we know no finer art object than the old cupboard with its locker or domestic credence covered with fair and brodered napery and furnished with silver, glass, or burnished pewter utensils.

Judging from the character of our illustration which we give this week—a Renaissance buffet—it might be argued that our remarks are inapplicable, and apply only to Gothic furniture; this we grant, but submit in explanation our desire to bring down the use of the "cup-board" to our own times.

The material is walnut throughout, with gold sparingly employed, and TARSIA work panels to dado frieze and lower panels, where carving would be beneath the eye, and also much in the way.

In place of the customary bas-relief of game, fruit, flowers, or other device, or the still more conventional mirror, we find in the centre of the composition a pane of plate-glass, provided with concealed curtains, forming a window opening into a fernery, which shows up in deep shade and side-light such works of art as may be placed on the sideboard; whilst the foliage of the natural background cannot fail to lend an air of freshness to an apartment specially in need of it.

O. W. D.

GOSSIP FROM GLASGOW.

(FROM OUR OWN CORRESPONDENT.)

THE year about to close has been a busy one with architects and builders. Of the many works which it has seen commenced or completed, a large proportion are public. Among these may be mentioned the Albert Bridge, in the east end of the city, the most important communication between the two sides of the river; the continuation of Canou-street to High-street, one of the schemes of the City Improvement Trust, and which has removed a large area of dangerous property, formed a new link between what may be said to be our St. Giles's and St. James's, and created in the heart of the city sites for buildings required by trade and commerce; the opening up of John Knox-street, another of the Trust's schemes, which, while promising sanitary improvement and increased facilities for traffic, gives us in the meantime a new and widely-embracing view of the Cathedral; extensive additions to the Municipal Offices and Local Law Courts; a large addition to Bridewell (the County Prison); an addition to the Royal Infirmary; a Hospital or Infirmary in connection with the College; Fever and Small-pox Hospitals; a Convalescent Home; a Lunatic Asylum

for the Barony Poor-house; an addition to the Post-Office; a Military Barracks; and a Fountain, commemorative of the introduction of water from Loch Ketturin. To these may be added such buildings as the Offices of the City of Glasgow and of the Scottish Amicable Assurance Companies; an addition to the Western Club-house; the chief offices of the Clydebank Bank; the south-side office of the British Linen Bank; and the St. Vincent-street branch office of the Union Bank. And although Glasgow does not now "flourish by the preaching of the word" (see the modern modified motto), it is still adding churches. Of those of 1871, at least three are of more than ordinary importance—the Episcopalians' in Great Western-road; the Kirk-of-Scotland's beside the Queen's Park; and the "Free's" in Dumbarton-road. Of such business premises as shops and warehouses that have been built in the year, there are several that, from their merit or from their extent may be noticed, such as Mr. John Orr Ewing's warehouse in West George-street; Mr. Robertson's shops and warehouses in Union-street; the auction-rooms of Messrs. Hutchison & Dixon in Renfrew-street; and of Messrs. J. & J. Morrison in S. George's-road; Mr. Donald's rivet works in St. James's-road; Mr. Watson's shops and dwellings at Bridgeton-cross; Mr. J. M. Robertson's shops and dwellings at Struan-terrace; and, if last, by no means least, a very clever alteration in Gordon-street, of a dingy old store into first-class shops and counting-houses. Glasgow, as might be expected, is getting around it a large family of suburbs. Some of these no sooner think that they can stand on their own feet than they endeavour to get quit of the parental leading-strings, and to set up "home rule." One of the first desiderata is a home for home-rulers, and accordingly Hillhead is building Municipal Offices. Others of them, hanging on by the skirts of their nurses, the public parks, thrive, as might be expected from the advantages they enjoy, nay, some of them not only "wax fat," but "kick." The public parks—three of them of very recent purchase—have for obvious reasons attracted dwelling-houses around them, and this year speculating builders have been as busy with them as ever. Indeed, the building of dwelling-houses of every grade, both within and immediately around Glasgow in all directions, has been this year exceedingly active. A mansion for Mr. Bell, potter, and several terraces on Great Western-road may be mentioned as in the highest class. Dennistoun, Kelvinside, and Plantation are stretching out the city eastward, westward, and southward, and making tramways—the construction of which has just been begun—one of the absolute necessities of civil life. In this year Val-de-Travers and Limmer asphalt have, as well as tramways, been introduced to Glasgow. The alterations of buildings that have been made during the year I will not pretend to indicate. This seemingly "goes on for ever." In sculpture there is nothing to be noticed except the statue of Graham Gilbert in the Corporation Galleries; nor in painting, except in the views of Loch Ketturin in the Theatre Royal's representation of "The Lady of the Lake" for the Scott Centenary. If business be as brisk in the coming year as it has been in that now passing away, neither architects nor builders will have much reason to complain.

THE CAMBERWELL VESTRY-HALL COMPETITION.

AS we stated last week, twenty-four designs have been sent in this competition, eight being selected from which to make the final choice. The stipulated outlay is £8,000. In the conditions, intending competitors were told that the drawings to be submitted were to be limited to plans, elevations, and sections. According to the *South London Press*, with some of the eight selected designs perspective views are exhibited—a manifest disadvantage to the competitors who have adhered to the instructions issued by the Vestry. These eight designs appear to have been selected on account of their showing two principal entrances—one in the Peckham-road, the other in the side street, Havill-street, a street only thirty feet in width. In all the recently-constructed vestry-halls in London only one principal entrance is allowed, and, in fact, only one entrance can be necessary. The local journal well suggests that some competent architect of standing, such as Mr. Waterhouse or Mr. P. Anson, should be called in to report on the whole of the designs, and is of opinion that of the eight designs selected six could not be placed on the site, which is irregular in shape, the authors having completely ignored the difficulty by designing square buildings occupying the whole ground. We abridge from our contemporary a description of seven of the selected designs:—

"**A L'ŒUVRE ON CONNAIT L'OUVRIER.**"—This design, accompanied by a perspective view, is in the Classic style of the old-fashioned suburban villa type, having a portico facing the Peckham-road supported by four rusticated columns, the whole surmounted by a cornice and balustrade, presenting a rather commonplace appearance. The surveyor's and vestry clerk's offices are placed on each side of the main entrance, vestry clerk's office being lighted by a window looking into an area against a blank wall seven feet distant. A corridor leading straight through from the Peckham-road divides the building, with offices on each side; this corridor is badly lighted. A grand staircase at some distance from the entrance leads to the vestry-hall and committee-rooms on the first floor. The hall is placed on the Peckham-road front.

"**CIVIS.**"—This design is also accompanied by a perspective view. The style adopted is modern Classic. The front consists of a central block breaking through the roof, and two wings of three bays each. The ground plan shows rooms of most extraordinary shape, hardly a right angle in any, and the corridor leading from the main entrance would have an exceedingly curious effect in execution. The vestry clerk's and surveyor's offices are placed on each side of the entrance hall, with committee and officers' rooms on each side of the corridor leading through to the back yard. Strong-rooms, &c., are situated on the basement. The vestry-hall is placed at the back of the building on the first-floor, with adjacent committee rooms, &c. An interior perspective view of the vestry-hall is exhibited.

"**EXPERIENCE.**"—The most striking features of this set of drawings are two highly and heavily-coloured elevations, showing a building of the ancient and, as it was fondly to be hoped, almost forgotten type of what may be called the Portland cement Classic style. The ground plan provides the usual entrance from Peckham-road, with a corridor running straight through from front to back, with accountant's and vestry clerk's offices on each side of the entrance hall. No committee-room is provided on this floor, and no strong-room for rate books. The staircase and waiting-room are also at a considerable distance from the main entrance. The vestry-hall is situated on the first floor, fronting on the Peckham-road, with lavatories, &c., opening direct on the landing; three committee-rooms at back.

"**WELL CONSIDERED.**"—This design could scarcely be placed on the site. The vestry clerk's and accountant's offices are here placed on each side of the main entrance from the Peckham-road, the surveyor's office at back; the grand staircase faces the entrance. There are no committee rooms on the ground floor. The Vestry Hall is placed on the first-floor, fronting the Peckham-road, with three committee-rooms, &c., in the rear.

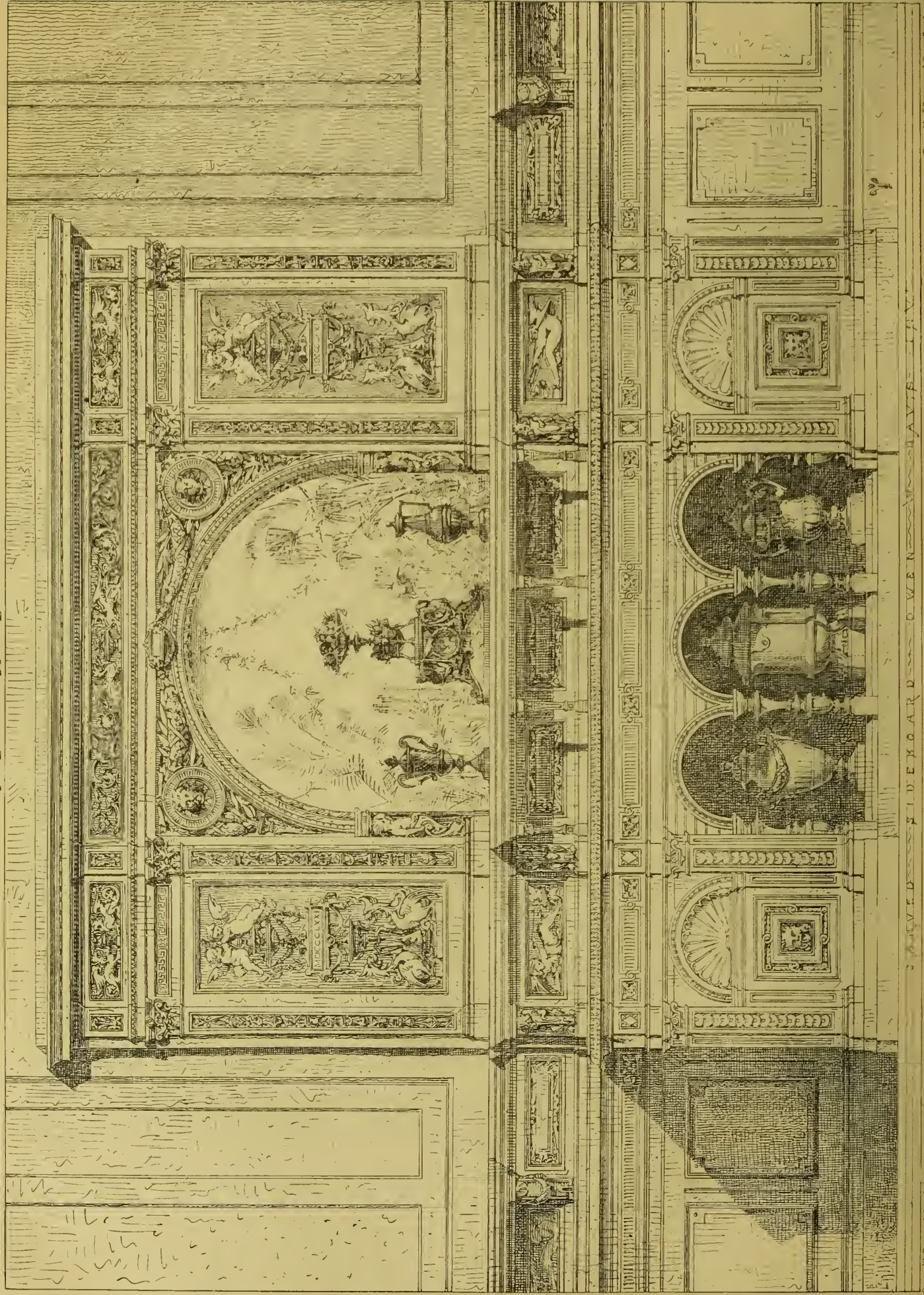
"**NIL DESPERANDUM.**"—The front elevation of this design shows a Classic building, and provides for five bays with a central entrance. There would probably be a difficulty in placing the building, as designed, on the site.

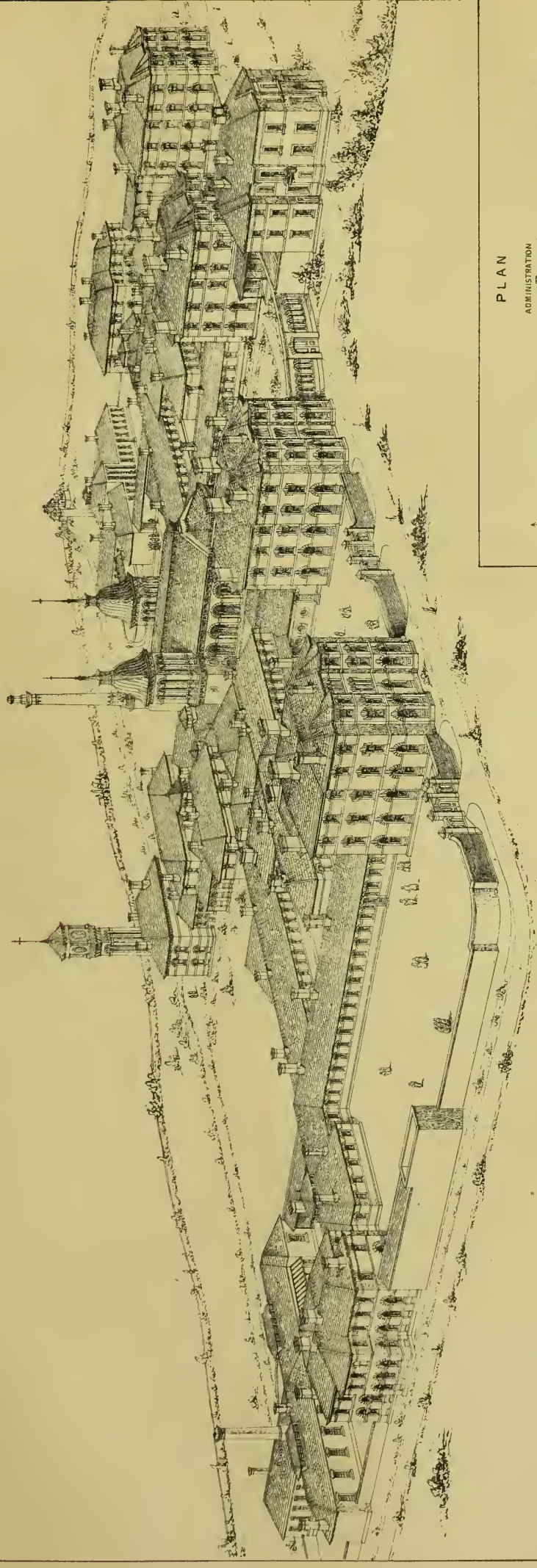
"**THOROUGH.**"—In this design also the author has totally ignored the site on which the building is to be placed, and has further illustrated the great difficulty of the problem by designing a square block—apparently a simple impossibility—on the site.

"**EXCELSIOR.**"—This design has the principal entrance from the side street, with an entrance in Peckham-road. This plan also totally ignores the difficulty of the site.

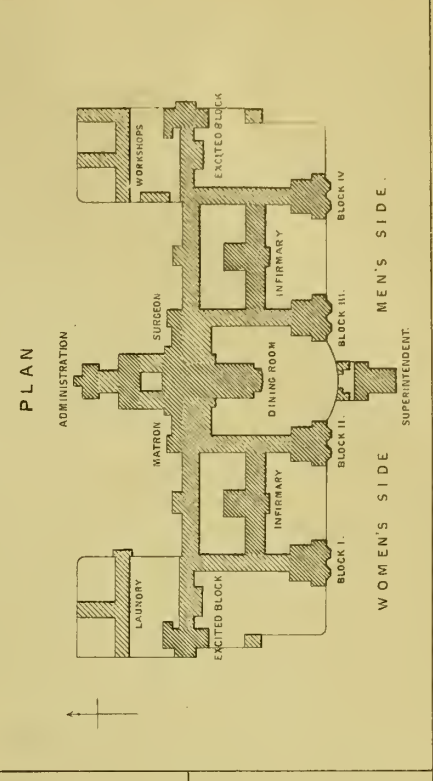
S. BARTHOLOMEW'S HOSPITAL SURVEYORSHIP.

MR. EDWARD PANSON was on Monday last elected surveyor to this institution, in the room of Mr. P. C. Hardwick, who lately resigned the appointment. The other candidates were Mr. Clifton and Mr. Marrable, who were selected with the successful candidate from a number who presented themselves. The contest between Mr. P. Anson and Mr. Clifton was extremely animated, the former having the support of the treasurer of the hospital, and the latter being supported by Sir William Tite and a numerous body of the corporation. The severity of the competition may be inferred from the fact that these two gentlemen polled 170 votes between them out of a constituency of a little over 300. Mr. P. Anson having 87 votes against 83 recorded for Mr. Clifton. Mr. Marrable polled only 5 votes, being 3 less than he obtained in committee. Mr. P. Anson is deservedly respected in his profession, and we congratulate the hospital upon the selection they have made.





NEW ASYLUM, CHESHIRE.
SOUTH-WEST VIEW
ROBT GRIFFITHS, ARCHT STAFFORD



PEDESTALS.

BY THOMAS MORRIS.

(Continued from p. 407.)

THE Romanesque column at Westminster Sanctuary has a quadripartite pedestal ingeniously developed from an octagonal stylobate. Four piers of polished granite are set anglewise against a stone die, and the whole are connected by a continuous base and enriched capping, both also of stone. But the strong contrast between the materials gives rise to a visual result which at a little distance is inconvenient. The white stone comes prominently in advance of the dark granite piers that are, in fact, more forward. Each pier bears a lion, as the emblem of nationality. This monument is an instance where the pedestal is inseparable from the rest of the design. There is no one part so paramount as to make the rest entirely subordinate; but each member takes an appropriate place in the composition, and contributes its share to the general perfection. The outline was necessarily determined by the particular site, and the character dictated by local associations. The conditions have been met, as usual by Mr. Scott, with great judgment, and the *ensemble* is eminently picturesque. The column of polished granite forms the dignifying link between the pedestal and acroterium (of stone), with its effigied niches, where *dos à dos* are seated the queenly stars of English history, Elizabeth and Victoria, each duly labelled. Successful warfare is denoted by the terminal allegory of S. George and the Dragon. The interchange of materials is perhaps intended to suggest the custom of the lower empire, when costly portions of marble and porphyry were taken from ancient edifices of the first magnificence, and employed in conjunction with new work of less pretension and durability. This monument has undoubtedly peculiar merit, but should hardly be made a precedent for metropolitan objects of the kind. The style is abnormal, and if it be a leading purpose of such erections to elevate and purify the common mind by the commemoration of virtue, art in a higher and more commanding compass should be displayed. These Westminster lions are small and unobnoxious to criticism if simply regarded as architectural accessories conventionally treated in an admittedly depressed taste; but for one observer who appreciates the intention, ninety-nine will probably think they have seen more lion-like imitations, and thus preceptive force is weakened, if not altogether lost. The granite examples in the Egyptian Gallery at the British Museum are as conventional as these, but how surpassing in expression! The graceful half-turned attitude, the relaxed limbs, the very looseness of the skin, show life in conscious but luxurious repose; and he must be insensible indeed who can look on unstruck by reverence, if not with awe. If heraldry, which is hardly so extensively and effectively employed in this Raglan column as might have been the case, is to be taken into account, I would say that heraldry must learn to compensate for want of general exactitude by intensified character and spirit—the dashes of a master must be given, though he scorn to be minute.

Let me now with loyal deference approach that yet-progressing fair triumphal shrine of love, munificence, and skill, the Albert Memorial in Hyde Park. The eminent attributes of the late prince secured for him the affection of British subjects, and homage in every quarter of the globe. Never was royal husband more lamented in his early tomb than he, nor widow more deeply stricken, more inconsolably bereft, than Queen Victoria. The relics of the old world wonder from Iliacarnassus find shelter here just when English annals present by singular coincidence a royal parallel to Mausolus and Artemesia. The magnitude of public grief occasioned by Prince Albert's death is equalled by grateful recollection that he lived. Grief must cease with living men, but the gorgeous cenotaph will preserve remembrance through distinct generations. The superb baldachino, designed in the fulness of ecclesiastical splendour, beams with devotion and unsparing sacrifice. No part is left undecked, but pictures in mosaic, lustrous bosses of the rarest stone, celestial imagery, and gilding, clothe the whole. In size it reduces the wayside crosses of Queen Eleanor, those piously-

remembered gems of early art, to the limits of mere toys. The pedestal proper, and the portrait statue, the nucleus of all, are not complete; but about the base are beginning to appear some of the finest productions of British sculpture. They are wrought in fine Sicilian marble which, it is presumed, will long resist the assaults of the English climate, and is of a purer white than any mentioned by Mr. Sidney Smirke in his "Recollections of Sicily," read to the Institute in 1860. An early description is expected with interest from Mr. Scott; but the one circumstance to which I would allude is the harmonious action of many eminent artists, as in the Nelson column, and as was the case, indeed, in the Carian Mausoleum itself. Scopas, Timotheus, Leochares, and Braxias took each a side, and Pithis had the roof. Such co-operation is highly conducive to the promotion of art, and can only be effected under a presiding architect. Sculptors have little acquaintance with construction, and their masonry is not to be commended. A marble plinth in Westminster Abbey, assumably two feet thick, and bearing ponderous lions, is made of four-inch slabs. (In another example, where great labour has been spent, that which purports to be a block of Sienna is of thin facing, with the offence against all rule in stonework, a mitred joint.) In a granite pedestal at the West End joints occur where there should be none, and others are ostentatiously incised in rustic where they neither are nor should be. In every extensive monument there is much of mere construction that can be executed with reasonable economy by practical builders only. It falls within the province of science, not of art, and where the sculptor undertakes the foreign and derogative work he incurs vexation to himself and loss to his employers. What embarrassment would have been avoided had the appropriate course been followed in an important instance now in progress. The core might have been produced in a twelvemonth, and the unburthened sculptor left free for his proper duties. But under the mistaken practice of the day, years have escaped in the accomplishment of a work to which the public yet looks hopefully. They are years of loss to the artist's spreading fame as well as to the gratification of those who knew and honoured the hero here alluded to. A monument, like an annuity, loses value in compound proportion when deferred. There is no real or reasonable ground for antagonism or jealousy between the arts of architecture and sculpture or their respective professors. Their aims and provinces are perfectly distinct, and severally defined. The elements of architecture are inorganic, its field of imitation is limited and conventional, its prime manifestation is immobility. The architect devises masses and proportions the components. But sculpture takes the world of animation, deals with the poetry of form, invents an allegoric plot, reveals the passions of the actors, arrests the changing play of life, and leaves the scene in stone. I say then, both in the interest of art and science, that wherever one block has to be set upon another an architect should be employed.

This observation will apply with unabated force to isolated equestrian statues, a class that so severely tests artistic powers. They were of late invention in the ancient phases of art, and faithful portraits in ordinary or military costume, as were also those in triumphal cars with from two to six horses; but most of these antique works, probably through having been executed in bronze, and melted down in times of need, have disappeared. One small example in marble alone graces the Roman gallery of the British Museum. Had the favourite horse of Verus been wrought in stone instead of gold, it might have been there too. The bronze horses of S. Mark have escaped the melting-pot into which human celebrities have been freely thrown; but no divinity could save a horse of gold. Considering the early date at which equestrian statues began to adorn the metropolis, and the noble character they are so capable of receiving, it is discouraging to witness the little progress made in their treatment. Charles I., at Charing-cross, the earliest, is also generally considered the best example we possess. It shows the King, while no presentiment of evil casts a gloom, with something of the making up of an exquisite; but he rides majestically, and the stiffness of his steed is simply sculptural. The pedestal,

though it does not, I should say, embody all the canons of conformable design, was evidently studied as an architectural accompaniment, and having been made the standard of slavish imitation, remains the best. As a pictorial example, George the Third's statue at Cockspur-street is admirable; the attitude and momentarily-arrested action of the horse deserve all praise. The King sits with all the firmness of an accomplished rider, and the gracious bearing for which he was remarkable. The extraordinary stump that acts as substitute for a pedestal can only be accounted for on two suppositions, of which the first is that no architect was consulted, and the second that the sculptor was paid for his statue on condition of throwing a pedestal in. Chantrey's George the Fourth, at Trafalgar-square, is not in the spirit of the place, and will have to be removed. It might serve, perhaps, as a crowning figure for the Marble Arch, if that fabric were duly prepared and recomposed as the Wellington Arch at Hyde Park Corner ought also to be, if the statue of the great captain is to remain. The requisite change is easily demonstrable. The attic must be removed, and replaced by a pyramidal form or, with yet more elegant effect, a colossal *zoccolo*. The position given to Wellington is perhaps the best that could be named. The handsome arch required some grand terminal, and this has been supplied by chance. The random association may not have all the fitness of design, but it might have been less fortunate, and a judicious effort alone seems necessary to convert this ornamental fabric into a perfect *arcus triumphalis*. The opposite façade would not be injured if crowned by military trophies, nor would the Marble Arch be spoilt by a bestriding hero. There are few situations in the metropolis suitable to equestrian statues of large dimensions. The enclosed squares are in every sense private areas, and more applicable to concealment than display. Marochetti's Richard I. cannot be deemed adequately seated in Palace-yard. It requires a composed pedestal of proportionate mass, an elevated site, and space enough for a conspicuous object to be viewed at an agreeable angle. Disproportion between pedestal and statue naturally ensues when they are neither designed together nor by minds acting in unison. The base, therefore, cannot add in its full degree to the general form, or assist in helping on the subject of the superstructure.

An equestrian figure of the late Prince Consort was lately presented to the City of London, and a favourable opportunity seemed to open for obtaining competitive designs for the pedestal; but a claim preferred by the sculptor has been respected, and the pedestal will be prepared by him, it is understood, in conjunction with the architect of the Holborn Viaduct, on which the work is to be placed.

Under the enlightened interest in historic events that now actuates a numerous class, the day may not be distant when a monument to King William I. shall engage public attention, and suitable illustrations for its pedestal may be found in the tapestry already incidentally alluded to. Its length would encircle in four courses a cylinder 17ft. diameter, or any equivalent figure, and the subject-matter being ready, the execution of such a work would, without doubt, excite a lively interest among artists.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting of this Institute on Monday evening last, Mr. E. T. Anson, Vice-President, in the chair, several donations to the Library were announced, including a bequest of £25 by the late J. W. Fraser, Contributing Visitor, for the purchase of books.

The following gentlemen were then balloted for, and declared duly elected: As Fellow, Mr. Richard George Smith, of Kingston-upon-Hull; and as Associate, Mr. Thomas Williams, of Frederick's-place, Old Jewry.

Mr. ARTHUR CATES then read a biographical notice of

THE LATE SIR JAMES PENNETHORNE.

Mr. CATES observed that the late Sir James Pennethorne was an architect devoted to his art. The earlier portion of his official life was almost exclusively absorbed in the performance of duties for which his skill in contrivance and his business habits and energy well fitted him, but which afforded few opportunities for the development of his architectural

skill, and when such opportunities arose they were too often trammelled with conditions which were most prejudicial to art. From the nature of the position which for more than thirty years he so honourably filled, any memoir of Sir James pretending to do justice to his labours would, in fact, be a history of almost all that had been done or projected for the improvement of the metropolis within that period, and of most of the great public works therein undertaken or projected by the Government, and would comprise a statement of grand projects, once quite possible, brought almost to the point of realisation, and dropped and neglected as of no importance, till at last they became impracticable. Born at Worcester in June, 1801, Mr. Pennethorne came to London in 1820, and entered the office of Mr. John Nash, under whose care, and that of Mr. Augustus Pugin, he received his professional education. A sojourn in Rome was then an essential feature in an architect's course of study, and in October, 1824, he left London for foreign travel, arriving in Rome in December of the same year. The course of study he followed, being somewhat different to that of most architects, might be quoted in his own words from a letter to Mr. Nash:—"The first thing we do is to make a picturesque sketch of the building, showing exactly its present state and situation with regard to the other buildings, neatly finished in colour on the spot, which we find the best and quickest way; and while doing this we have time to consider and examine the general mass and proportion; these sketches are about 9in. by 15in. . . . This is the first and easiest part; and the next step is to make a drawing of the remains in plain outline, to a very large scale (on the spot), shaded very slightly but very boldly, in Indian ink, to get exactly by eye the details, proportions, and bas-reliefs, with all the ornaments. At the same time we shall, if it is possible to get permission, take only the general proportions in measurement, to impress them on our minds, and after this we shall always, as far as we can, make a restoration of the building, our studies being, as we imagine, divided into two classes, the ornaments and details, and the general ideas and proportions of the buildings, as also their plans, and all the peculiarities connected with them, and this part requires a great deal of knowledge and reading, and can, at best, be but uncertain; nevertheless, it must be excellent practice to endeavour to follow the ancients through the whole of their designs, and without doing this it is impossible to have any idea of their grand conceptions, or, indeed, of the mathematical correctness of all their proportions, even to the slightest detail." He also found great advantage to accrue from drawing from the life at the Academy and from the sculpture in the Museums. His attention was specially devoted to a restoration of the Forum, and his large drawing of this subject was exhibited a few years ago. The numerous and excellent drawings which he periodically transmitted to Mr. Nash, and the details comprised in the critical letters which accompanied them, amply testified to his industry and ability. In the autumn of 1825, Siena, Florence, Genoa, Milan, Venice, &c., were visited. In the summer of 1826 he went to Naples and Sicily, and returned to England at the end of the same year, when he took a leading position in the office of Mr. Nash, and as his principal assistant conducted the execution of the Straud improvements, Carlton House-terrace, St. James's Park, and other similar works. In 1832 he was, in consequence of the experience gained by his connection with Mr. Nash, employed by the Commissioners of Woods, and commenced to devote his attention to the improvement of the metropolis. The great works which had been carried out under the inspiration of Mr. Nash, and by which the West-end of London had been in fact created, were completed. The source from which the funds, lavishly but wisely expended, had been derived, was no longer available; and a select committee of the House of Commons having, in 1838, approved and recommended for adoption the plans submitted by Mr. Pennethorne for metropolitan improvements, he was (with Mr. Chaumer) appointed to carry them out—not, however, as designed by him, but trimmed and pared down to satisfy the requirements of economy; and although the four streets authorised by the Act 3 and 4 Vic. cap. 87—viz., New Oxford-street, Endell-street, New Coventry-street, and Commercial-street, Spitalfields, had proved of the utmost service to the circulation of the traffic of the metropolis, it was now certain that had his enlightened views prevailed over the narrow spirit which influenced the decision on his plans, the metropolis would not only have been greatly benefited, but improvements greatly needed, and now rendered almost impracticable, would have been carried out at a moderate cost. It was important that his having acted at the Executive Offices of the Royal Commissioners

for Improving the Metropolis should not throw on him any responsibility for imperfections in the works carried out, against which he constantly protested. Until the formation of the Metropolitan Board of Works in 1855, he was constantly engaged in devising schemes for improvements, which were more or less advanced, some even having been brought into Parliament; but all general projects fell through from the difficulty of providing the necessary funds. Besides the formation of the new streets and other improvements, such as those at Pimlico, Kensington Palace Gardens, Windsor High-street, &c. he carried out Victoria, Kennington, and Battersea Parks, the works of the latter, after many years of delay, having been hurried on in a manner which prevented the complete realisation of his design. The scheme of a Northern park, which in 1852 was proposed to be formed under the name of the Albert Park, was fully worked out by him, and had funds been available the project realised, it would have added largely to his reputation as a landscape gardener. In 1843 he visited Ireland as Royal Commissioner to inquire into the construction of the workhouses. Previous to 1840, when his entire services were required by the Government, he had carried on a considerable practice as an architect. His design, submitted in competition for the Royal Exchange, was one of the five selected. Until 1845, however, no opportunity was afforded him of applying his architectural ability to the public service. It then being determined to erect a Museum of Economic Geology, on a site between Jernyn-street and Piccadilly, the preparation of the designs was placed in his hands, and after having undergone the usual course of emendation and reconsideration, to please the varying tastes and fancies of succeeding First Commissioners of Works, the building was erected, and deservedly took a high position among the edifices of the metropolis, whether from the dignity of the well-studied elevations, the picturesque effects obtained in the interior, or the remarkably commodious arrangements by which so much accommodation was so well provided on a limited site. The success of this building speedily brought to him further employment, and he was soon engaged on designs for a Public Record Office. The history of almost every public work on which Mr. Pennethorne was engaged would illustrate the long period of incubation which in this country intervened between the acknowledgment of the necessity or desirability of an undertaking, and its realisation, after many years of vacillation and delay. Mr. Pennethorne, having been for some years engaged as adviser of the Commissioners for Metropolitan Improvements, in May, 1847, submitted to them a plan for providing an improved communication between the east and west portions of London, the plan having been made by him in 1834, and laid before the Select Committee of the House of Commons in 1838, and of that street the only portion now formed is Coventry-street, leading from Piccadilly to the west end of Long Acre; of this proposed great central thoroughfare a portion would have passed through the Rolls estate, connecting Chancery-lane at Carey-street with Fetter-lane. At the same time Mr. Pennethorne submitted a project for erecting on the south side of the new street a General Record Repository of a comprehensive nature, carefully elaborated, and combining all the essentials for such an establishment. In 1850 Mr. Pennethorne's design for a much smaller establishment than that contemplated in 1847, and in accordance with which the fragment of the building now executed had been erected, was laid before the House of Commons, and a vote of £30,000 on account was granted. The first portion was commenced in 1851; in 1863 a further portion, part of the east wing, was undertaken, and in 1865 the upper story of the central tower was undertaken—not the grand and lofty feature which Mr. Pennethorne's design had contemplated, but just so much as would provide certain accommodation then urgently required. In 1868 the contract for completing the east wing was let, and in the spring of the present year Sir James was engaged in completing his designs for the west wing, which would occupy a large site extending to Chancery-lane. The removal of the Colonnade of the Quadrant, Regent-street, afforded Mr. Pennethorne an opportunity of skillfully devising an elegant arrangement of balcony, which redeemed the meanness of appearance of the range of shops, and gave a certain dignity to the street. Additions to the Ordnance Offices, Pall Mall, followed, and elaborate designs for a new War Office on that site were prepared. The removal of the Excise Department of the Inland Revenue from Broad-street to Somerset House gave rise to the necessity for enlarging that building, and a new wing

facing Lancaster-place was decided on. Mr. Pennethorne, sacrificing his own fancy, studied the work of Sir William Chambers, and had, in the most happy manner, added another façade to that noble building. On the completion of this work, in 1856, seventy-five of the leading architects of the metropolis presented to him a gold medal in commemoration of the success which he had achieved. About that time he was fully occupied with architectural work of varied character, the most important being the new state ball-room, supper-room, and galleries at Buckingham Palace (a suite of rooms of high importance, and specially to be noted for their richness of decoration); the reconstruction of the central portion of the National Gallery, providing in the space occupied by the old hall and staircase new staircases, a sculpture-room for the Royal Academy, and a fine gallery for the national collection; the new office for the Duchy of Cornwall at Buckingham Gate; the district post-office at Pimlico; new stabling and extensive alterations at Marlborough House; the Library of the Patent Office; and many other works were executed between 1850 and 1869. Mr. Pennethorne was also much occupied during that period with designs for intended public works of great magnitude, especially for the National Gallery, not only on its present site, but for the Burlington House site, and one in Kensington-gardens. Several series of designs were also prepared for public offices in Downing-street, and, before the great competition, he had prepared designs for the concentration of the public departments on the site extending from Downing-street to Great George-street; and he was also one of the invited competitors who submitted designs for the Albert Memorial. Thus situated as a servant of the Government, debarred from all those opportunities of distinction which private practice could have afforded, his professional career might be considered to have been one of continually-recurring disappointment. Employed to carry out his conceptions for improvements in a mutilated and fragmentary form, and ever on the eve of executing some grand work worthy of his skill, and which might hand his name down as a great architect, the hour for the realisation of his aspirations was ever deferred. Still he worked on under great discouragement, and faithfully performed his duty to his employers, whether in the Office of Works, or in the not less important, if not so prominent, office which he held as architect to the land revenues of the Crown in London, and professional adviser to the Commissioners of Woods in charge of those estates, in the management of all the business relating to which he was most successful. But the one opportunity was afforded him, and his last and his most complete and successful work, the University of London, would ever testify to his ability. Shortly after the completion of the University, the re-organisation of the Office of Works having led to the abolition of the offices which he held, Mr. Pennethorne retired from the public service on a liberal but well-earned pension, and in November, 1870, his great services received higher recognition by the conferring upon him of the honour of knighthood. He did not long enjoy his retirement. On the 1st of September last, having visited London in the apparent enjoyment of full health, he returned home, and was suddenly struck down, and thus, almost with the termination of his official employment, he passed away from this world. He was elected a Fellow of the Institute in 1840, and was also a member of the Academy of St. Luke at Rome, and of the Society of Architecture at Amsterdam. In 1865 he received the Royal Gold Medal of the Institute.

DISCUSSION.

Mr. CHARLES BARRY, in proposing a vote of thanks to Mr. Cates, said it would scarcely be desirable or in good taste to enter upon a critical disquisition on the works of Sir James Pennethorne, whom he had known for a good many years, and could bear testimony to his courtesy and integrity of character. He (Mr. Barry) was one of those who joined in the subscription for a gold medal, a general feeling being entertained by the profession at the time that Sir James had been very unfairly and ungenerously used by Sir Benjamin Hall.

Mr. FERREY, as Sir James's oldest friend and fellow pupil, said he most feelingly seconded the vote of thanks to Mr. Cates for the justice he had done Sir James Pennethorne's memory.

The CHAIRMAN said he had the greatest regard for the works of Sir James, and he could also bear testimony to his urbanity and kindness. It was gratifying that the memory of one whom they had so lately lost should be brought before them in so pleasant and genial a manner.

Mr. E. HALL directed attention to the position of difficulty in which Mr. Pennethorne had been placed in carrying out some of his great works. During the whole

* For list of his works, see Sessional Papers of Institute, 1856-57.

time the works were in contemplation he was thwarted in a manner which it was now scarcely possible to conceive. If the lines of Endell and Coventry streets had been carried out as he had intended the projecting corners would have been avoided. With regard to the Bow and Endell streets designs, the defective arrangement was attributable to a disposition to save expense and to utilise one side of Eudell-street.

Professor KERR regarded Sir James as the last of the Government architects. He had advised the Government respecting the architecture of London in much the same manner as did his predecessors Soane, Nash, and Smirke. It was now understood that the conduct of architectural affairs by the Government would be managed without an architect. Sir James was a man of great ability and special education, and he had devoted his lifetime to the great work of metropolitan improvement. He (the Professor) had always held that to lay out money for the improvement of the metropolis was a desirable investment, and that it was a great pity that financiers and men of business could not be made to see this. There ought, he conceived, to be a Parliamentary Committee entrusted with the public money and architecture of the country in a common-sense way, and with laying out those schemes of improvement which somebody must lay out. He had been greatly pleased with Mr. Cates's paper, and had always been impressed with the kindness of manner and integrity of purpose of Sir James.

Mr. WEST observed that in planning streets in London and Paris there was a great difference. In London they could not, as in Paris, drive streets haphazard, for the probability was that the shops would not let, and a very large loss would accrue.

PROFESSOR KERR said he understood, from Sir William Tite, that the loss upon every new street in London was 60 per cent., and it was the same in Paris.

Mr. WEST observed that this must be upon what streets were selected in making a new town.

The discussion was continued by Mr. Pheniers and Mr. Robson, and the vote of thanks was then put from the chair, and Mr. CATES, having acknowledged the compliment, and remarked on the salient points of the discussion, the proceedings closed.

ARCHITECTURAL ASSOCIATION.

AT the ordinary general meeting of this Association on Friday evening last, Mr. J. Douglass Mathews, Vice-President, occupied the chair, and the following gentlemen were elected members—viz., Messrs. J. Bardsley, W. Barnett, W. Allen, H. H. Stannus, W. Pringle, G. D. Oliver, and W. Todd.

Mr. QUILTER, one of the hon. secs., said he was requested by the secretary to the general committee of the Architectural Art Classes to state that the prize of two guineas offered to the members of those classes for the best drawing from the antique had been awarded (in the shape of books) to Mr. H. Gay.

The CHAIRMAN then announced that, owing to some mistake, a second prize of one guinea offered by Mr. Godwin for the best design for a London street house seemed to have been overlooked. The judges had now decided, however, that the design bearing the motto "Kiln" was entitled to the prize. The author of this design was Mr. Odams. With regard to a prize offered by Mr. Lee, President of the Class of Design, for the best summary of subjects treated in the Class during the last session, it had been awarded to Mr. J. A. Reeve.

THE ROYAL ACADEMY PRIZES.

Mr. PHENE SPIERS then drew attention to the designs (hanging on the walls) of the successful competitors for the Academy prizes. He stated that all the prize-holders were prominent members of the Association. The Gold Medal had been awarded to Mr. W. G. Davie, who also obtained the Soane Medallion at the Institute this year. The Travelling Studentship had been won by Mr. R. S. Wornum, and Mr. Arthur Hill carried off the first-class silver medal, and books, for the best measured drawings of the round portion of the Temple Church, London; the second silver medal was gained by Mr. Kersey. All these gentlemen had been for some time members of the Association.

The CHAIRMAN remarked that, with very few exceptions indeed, all the prize-holders, both of the Academy and Institute, had, during the last few years, been members of the Association, and this was an augury that the Association was doing a really valuable work.

ARCHITECTS AND SEWERAGE.

The CHAIRMAN next adverted in terms of sympathy to the serious illness of the Prince of Wales, remarking that the architectural profession had been dragged into the controversy respecting the cause of the Prince's illness, and had had bestowed upon it its usual amount of kicks and fault-finding, both by the press and the public. He protested most heartily and resolutely against the attacks that were constantly being made upon architects. If doctors differed on such vital points as had been raised in connection with the Prince's illness, how were architects to take upon themselves the responsibility of advising in matters of the kind? He did not say that present arrangements for drainage were complete, but he would say that architects would readily carry out any suggestions that might be made to them by persons competent to do so. In conclusion, he suggested that some sort of conference might be called, in which architects, doctors, and sanitary reformers might discuss the matter, with a view to eliciting the best and most efficient means of house drainage, and to lay down some definite laws on the subject for the guidance of architects and builders.

Mr. H. L. FLORENCE, A.R.I.B.A., then read a paper

ON THE MEDIEVAL ARCHITECTURE OF NORTH AND CENTRAL ITALY.

After some introductory observations of a general character, he called attention to a paper "On the Architecture of Northern Italy" read by Mr. C. Aldridge before the Association in 1869, as containing a description of various towns of North Italy and their principal buildings, and said that in the present paper he should endeavour to supplement Mr. Aldridge's paper by a study of the towns left unvisited by that gentleman, continuing the description of Italian art and architecture through central Italy to the walls of Rome. The history of Mediæval architecture in Italy might be held to commence with that period when the three great influences of the early Christian era began to unite and form one distinctive whole, when most of the early churches were reconstructed, and civic buildings founded—in the eleventh and twelfth centuries; and although they were rebuilt in much the same style, yet the whole of Europe was at that time in a state of transition, and increasing ecclesiastical and feudal powers, replacing the older traditions and Pagan influences by novel ideas and by new wants and requirements, rendered necessary many modifications, and in time led to a style generally termed Italian Gothic, though differing in many essential particulars from the Gothic north of the Alps. The three styles thus later incorporated were at that period of transition, firstly, the Romanesque, descended from the ancient Roman architecture; this had a firm hold on the affections of the people, and exerted its influence through every succeeding style, until it was at length merged into the Renaissance. The second influence emanated from Byzantium, giving a new impulse to art, and leading to new combinations, its great achievement, the dome, influencing to all time the spirit of Italian architecture. Thirdly came the Lombardic style, which was really a northern Romanesque, still further Italianised by being carried out by Italian craftsmen. Having given a brief historical sketch of the progress of these styles, Mr. Florence referred to the influence which it had been asserted the Crusades exercised upon European Mediæval architecture. He thought it would be found, on consideration, that in the twelfth century art and architecture, while in course of transition, instead of approaching to Eastern art, gradually emancipated themselves from its sway, and by the thirteenth century the rupture was complete. Mr. Florence then proceeded to trace out a general outline of ecclesiastical architecture in Italy from the sixth to the fourteenth centuries, and then noticed a few of the most marked divergences from Northern art in Italian Mediæval work. The Italians cared little for constructive delicacies, used as few piers as possible, walls thick enough to resist the thrust of the vaults without buttresses; and requiring but little light, their window openings were of simple form, rudely glazed, for their long simple, solid walls glowed on the interior with the most glorious frescoes and mosaic, priceless and invaluable in themselves, but reducing the architecture to the second rank. In most cases the plan of the nave was set out in squares, and the span of the side arch equalling that of the transverse arch, there were necessarily but few compartments. The aisles were divided into paralograms twice their width in length, the long side parallel with the nave. Thus the side walls of the church were brought into full view, and made still more

conspicuous by the wide pier and the principal windows placed therein. The height of the nave was about equal to twice its breadth. The triforium disappeared entirely, and the clerestory was replaced by a small circular window. These churches were by no means beneath their Northern rivals in size. The vaulting was quadripartite; Mr. Florence said he knew of only two instances of sexpartite—viz., Piacenza and the Certosa of Pavia. The piers were either simply cylindrical, as at Siena and Orvieto, or of a very favourite form—a square with a large bead in each angle, as at S. Petronio, the capitals being banded by rows of leaves. To one accustomed to the intricacies of Northern work, there was an almost unpleasing baldness in this simplicity, but yet there was a clearness and greatness of idea which went far to counterbalance that impression. In the Cathedral, Florence, and at San Petronio, however, these vast proportions become oppressive, and even the beautiful arrangement of plan at Florence, leading to the triapsal eastern end, and crowned by Brunelleschi's dome, did not compensate for the heaviness and gloom produced by the vastness of the parts and the insignificance of the window openings. It was singular to observe how through every age the strong impulse of the Italians led them to the use of the Byzantine cupola (a feature never adopted or even essayed by Northern architects)—from the Early Romanesque at Pisa, the crossing domes of Pavia, Milan, Monza, Parma, Arezzo, and others; hemispherical at Venice, Padua, Siena; and in the later Gothic at Santa Maria delle Grazie at Milan. A fine example of octagonal dome was to be found at Chiaravalle, near Milan, and most likely the dome at Florence was originally intended to be of that description. The vaulting was always highly domical, and still, after many changes and fortunes, the dome was the chief glory and unrivalled excellence of the revived Italian school. A novel arrangement frequently occurred in the eastern chapels, which, instead of being grouped round the central apse, were placed side by side with it. S. Domenico at Siena had seven of these chapels; S. Croce, Florence, eleven; Santa Maria Novella and S. John and Paul, each five; the Frari, seven. The chapels at the Frari had the further peculiarity that all the apsidal terminations finished with an angle in the centre. In the composition of the west fronts arcading was very generally employed, either in successive tiers, as at Pisa, Santa Caterina, and S. Miele in Borgo, or in one single tier, the height of the walls, the great semicolumns, with their arches, rising up to the flat gable, as in the Lombard churches. The Later Pointed style usually followed the section, having three gables, the lower story being occupied by the great entrance doorways. These west fronts still remained to many a church whose interior had long since been remodelled or rebuilt, as at Ferrara, Spoleto, Assisi, and many others, and in even more cases the beautiful doorways had been spared. In no feature did the Italians seem to have been more successful than in their treatment of doorways, as might be seen by the examples at Siena and Orvieto. In the Pisan school at Lucca, Pistoia, and elsewhere, a large and deep transom was invariably used, richly carved, generally with a flowing scroll ornament, Classic in feeling. At Siena this transom was frequently a segmental arch, and in brickwork was repeatedly seen in the domestic buildings. The bisection of the doorway was rare; a good example, however, was St. Anastasia at Verona. Although the large traceried windows found in every transalpine cathedral were quite unknown in Italy, there were several forms of tracery used deserving notice. The plate tracery, of which a good example occurred at S. Anastasia, Verona, accorded well with the simple forms of the architecture, being broad and flat in effect, the dark openings giving depth and relief to the play of sunshine. In Siena and Venice windows of lancet proportion were used, but a peculiar effect was given by the great depth of the transoms, and by the defining of the lines of the tracery by the dentil bordering. Having described various other features of the ecclesiastical architecture of North and Central Italy, Mr. Florence briefly treated of the civil and domestic architecture of the same territory, remarking that there were few towns which more recalled the Middle Ages than did the mountain cities of Central Italy. In conclusion, Mr. Florence asked these two questions. (1) What is the value of Italian architecture? (2) How will its study be profitable in the present day? These were questions of some importance. Doubtless differences of opinion existed thereon, but he ventured to think that much of the dislike or indifference with which the Southern style was regarded was due to the injudicious use of the word "Gothic." If the term was used as describing a style of art carried to perfection in France and England, and to a great degree of excellence in Germany, and that standard of per-

fection was then applied to Italian buildings, could we be surprised to find the latter fail in the comparison when it left their distinctive excellences untested? The history of Gothic in the North was the history of the arched principle. The pointed arch was all-important, even causing modifications in turn leading to still greater changes, but the mere presence of the pointed arch did not constitute a Gothic style. We looked in vain in the most perfect Gothic buildings for the spirit of the Romanesque, but in Italy it breathed through all. The soul was there, but the soul's garment was changed; the pointed arch was adopted, but Mr. Florence said he did not trace any great results from its use. On the contrary, all the most successful features were derived from the Romanesque or Byzantine. It was Mediæval architecture, but it was not Gothic. He suggested that no building wherein the round arch might be substituted throughout for the pointed, without in any way influencing its structural completeness and progressive development of idea, could really belong to the true Gothic. He further submitted that a style in which such transformation might take place, and yet leave it as a style good, perhaps yet more consistent and perfect, must in itself possess those characteristics forming a distinct type, and instead of being a subdivision of the great Northern school, might rank as an individual style by itself, and by terming it "Pointed Romanesque," it completed the long chain of art history from the Roman to the Renaissance. The great merit in each period of Italian art was breadth of effect, dignity, and repose, which, if unaided by colour, would seem sometimes to be severe almost to excess. It enjoyed also the great merit of having encouraged and developed the simultaneous progress of the allied arts. In the present day there was much room for breadth of treatment in our architecture. The picturesque was ever being strained after, and in a frontage of 20ft. were crowded in the distinguishing detail of almost as many styles. Two other points on which much might be learned from Italian Mediæval architecture were the proper use of brick, and the right employment of colour. Brick was pre-eminently an English material, yet it was one which seemed to be almost always regarded as unarchitectural, and one which was often used in a very unsuitable way—witness the flat arches over our windows. The true use of brick required the arch. Italy alone furnished us with architectural precedents for the right use of brickwork in towns. In regard to the use of colour, it should never be allowed to usurp the place of form, but might be used to strengthen and define it, and to relieve poverty of material or enforced bareness of surface. It should never attempt to supply the place of relief or projection.

An animated discussion ensued, in which Messrs. R. Phéné Spiers, Robins, Redgrave, Jarvis, Ridge, and the Chairman took part, and the usual vote of thanks having been given to Mr. Florence for his paper, the meeting ended.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THE second meeting of this society for session 1871-72 was held on Friday evening last, Mr. A. C. Pain, President, in the chair, when Mr. C. H. REW read a paper on

ARCHITECTURE FOR ENGINEERS.

After some introductory observations, Mr. Rew remarked that the right understanding of the principles of architecture by engineers was of the greatest and most varied consequence and value. That English engineers had carried out works of great value and importance in almost every country in the world was a fact to be proud of, and while it was to be hoped that great works, even surpassing those that had been accomplished, were yet to be achieved by them, it was to be trusted that such future works might approach as near to artistic beauty as the past ones did to scientific and mechanical perfection. Up to the present, if our domestic architecture had been bad, our "engineering architecture" (if the expression might be used) had not been all that could be desired. Some of the railway bridges over the Thames, for instance, did not convey the idea of abstract and perfect beauty, while the preposterous roofs of our great terminal railway stations seemed first of all to suggest "how much you are in the open air when standing on the platforms under them." It seemed ridiculous to build such enormous roofs where headway was only wanted for the funnels of the locomotives. If it were argued that, to cover so great an area with a roof of one span, such a great height was a necessity, and that to divide the same area into portions by rows of columns was bad economy of space, it

might be said, in reply, that admitting the argument of economy (which was, however, an open question), the gain of a little more space in the platforms was very dearly bought by the frightful appearance of these large roofs from the outside. As for bridges, Mr. Rew feared that until the time came when engineers should turn their attention to building them of stone again, or at least until stone piers took the place of iron cylinders, papers on "architecture for engineers" would be at least premature, for anything more utterly above or below careful criticism than structures with no more artistic beauty than the Chatham and Dover Bridge at Blackfriars, or the South Eastern Bridge at Charing-cross, it would be difficult to imagine. In the new Blackfriars Bridge there was at least one great step in the right direction—viz., the adoption of piers of masonry, instead of the ill-proportioned and dropical iron columns seen in the railway bridges mentioned. But even in Blackfriars bridge the columns (or pulpits) standing on the cutwaters offended against the first law of good architecture—the law of Truth. Why those columns should be of their present diameter, with only a light parapet to carry, it would puzzle the architect, if not the engineer, to tell. Another, but smaller fault, was the absence of a moulding of some sort or other under the brackets or trusses to the cornice of the bridge: as they now were, they appeared to be supported by the very part they were meant to strengthen. These were examples which went to show that there were many points where great improvement was possible. It was, therefore, worth while to try to discover some of the simple (but too often neglected) principles in the application of which good architecture consisted, and to the application and understanding of which any improvement aesthetically of our engineering works (if it was to be made at all) must be mainly due. The subject would be better appreciated by starting with a clear understanding of what was really meant by the word "architecture" as distinguished from "building," for the things meant were quite distinct from, although often associated with each other. It was quite possible to have a building covering a large area, yet quite innocent of anything that could be called architecture. The building, so to speak, was the constructed skeleton; the architecture was that which determined the exact outward appearance of the perfect body. To build was literally to erect or construct—to fit and apply each material in the form and position most suited to its capabilities and nature, and so as to get the most work out of the smallest quantity of material; but, in the words of a modern writer, "building does not become architecture merely by the stability of what it erects, and it is no more architecture which raises a church, or which fits it to receive and contain with comfort a required number of persons occupied in certain religious offices, than it is architecture which makes a carriage commodious or a ship swift. That is chuch-building, coach-building, or ship-building, as the case may be, but it is not necessarily architecture." It had been well said that architecture was "the adding of unnecessary features to a building." For instance, if a stone bastion were erected—that was building; but if a projecting course of masonry was left near the coping, and caused to represent a cabelle—that was architecture. Or if an arch was thrown over a door or window opening—that was building; but if the arch stones were moulded or carved, that moulding and carving was architecture. Therefore, while there could not possibly be architecture without building (or, for that matter, good architecture without good building), it was quite possible to have building in which architecture was wholly wanting. Among the leading principles which distinguished good from bad, whether in architecture or building, firstly, and at the head of all, came the law of common-sense, or Truth. When this was wanting the building or architecture in question must be bad—utterly past amendment. No architecture or building which was a sham was worth anything but contempt. But if, on the contrary, having regard to the fundamental law of truth, a building was first of all planned, with each portion or room in its natural place, and where, from its intended use or connection with other parts, one would expect to find it, much had been done towards obtaining a good building. If the walls were solid and good, the doors and windows, and other subordinate parts, so grouped and placed as to weaken the walls in the least degree possible, another step had been taken in the right direction. If the roof was arranged to cover the building in the simplest and least complicated way, instead of, as was sometimes done, making it as elaborate and eccentric as possible, as if the designer had taken delight in getting into little dilemmas just to show how clever he was in getting out of them, still further was done in the right direction. And if the eaves were brought well over the walls, and the chimneys

carried well above the roof, the designer would be rather a genius than otherwise if the result was not something in the shape of a good building. Again, the subject might be yet further gone into by considering the use and nature of the materials employed. As regarded stone, as stone, the geological arrangement of the rocks was the surest guide to the right arrangement of the stone in the different stories of a building. Granite, which (speaking geologically) was the lowest or base stratum or system, naturally suggested itself as most appropriate in the lower stages of a building, or in any portion where great weight had to be sustained. As for the working of the individual blocks, the safest rule was to use the stone as soon as it was worked to the required shape, for whatever was done more was just so much ruination to it. In nine cases out of ten more labour was wasted in what was called "finishing" stonework than was spent or required to be spent in working it to the required form. People wondered why modern stonework looked so tame and lifeless. Writer after writer had pointed out that in the old masonry the stonework was "rough and ready;" yet in practice, they would not be content with having stonework wrought into shape, or *done*, but over and above that, it must be finished. And most thoroughly finished it was, so far as having any life or beauty left in it. As an instance, during the rebuilding of S. George's Church, Doncaster (one of the first in point of time, as well as of merit, of modern attempts at restoration), an argument was in progress between some members of the Restoration Committee, during a visit to the masons' yard, as to why the new stonework persisted in looking so tame, although the masons were working it as nearly as they could to the old sections. Nobody could tell until one of the committee happened to see a piece of moulding lying on a block. That, they all exclaimed, was exactly what they wanted, but they were corrected by the mason saying, in a tone of pitying condescension, that it wasn't "finished." That explained the whole secret, and no more "finishing" was allowed, the result being all that could be wished. Again, in the use of brick, the rule at the bottom of it all (and the infringement of which caused a very large proportion of architectural failures) was to "let a building look as if it was a brick building, and not a stone one." Brick, if rightly used, was as honourable a building material as stone, and quite as much (if not more) capable of being its own decoration. In London, brick, according to the doctrine of locality, was the right material to use, and was strictly speaking, "the indigenous building-stone of the neighbourhood." As instances of what could be done in brick architecture, Mr. Rew referred to the buildings on the east side of King's Bench-walk, in the Temple, and (of modern work) the small church of S. James's the Less and the more ornate one of All Saints', Margaret-street. Among the ways in which brick was misused was that of attempting, by grouping the courses, to give the idea of large blocks of stone. This was sometimes done by setting back every seventh course or so from the ordinary plane of the walls, the intention being to convey the idea that the six courses formed a single course of stone, and that the seventh was the joint. The same thing might be done by placing at regular intervals a double course of chamfered bricks. Another and very common thing was to see the wall built of one kind of bricks and the jambs and quoins of another. All such proceedings were directly opposed to the fundamental rule of truth and common-sense, for, taking the last example of the quoins, the mistake was not in putting the better material where there was more work to do or more exposure to bear, but in making it pretend to be what it was not. Just in the same way that in masonry one sort of stone was used for the ordinary walling and a harder and better kind for the quoins, where the means at disposal would not allow the better stone only to be used, so, in brickwork, it was perfectly rational to use an inferior sample of brick in the walls with a harder and firmer kind for quoins. But doing this honestly was a different thing to building quoins of brick that looked at a little distance as if they were stone, if bad and false. It seemed to the author that it might be taken as an axiom that the first step towards a right use of brick as a building material was to put utterly out of mind the notion that brick was *only* to be regarded as a cheap and nasty substitute for stone, and only to be tolerated where the funds at disposal would not admit of the latter material. He did not, however, object to the use of brick and stone in the same building, for of course there were portions, such as columns, with their bases and capitals, brackets, corbels, and, in fact, all parts meant intimately to be moulded or carved, for which stone was the only suitable material; but they should show at once, by their position and use, that they

had a reason for being of stone, and should not leave room for the idea that it was a mere freak or question of the moment with their designer as to which they should be. Of timber and iron there was not so much to be said as at first sight appeared. As regarded timber, its use was becoming almost a thing of the past, so that there were not so many chances of making mistakes as its more frequent use would afford. As the subject of ironwork was exhaustively treated of in a paper read before the society last session by Mr. Driver,* he (Mr. Rew) need not dwell on that subject on the present occasion.

As to the artistic part of his subject, Mr. Rew said that the first great characteristic which should be kept in view was what was meant and understood by the term "proportion." In order to attain this, it was necessary, according to Mr. Ruskin, to have one large thing and several smaller things, or one principal thing and several inferior things, and to bind them well together. "Sometimes," said Mr. Ruskin, "there may be a regular gradation, as between the height of stories in good designs for houses—sometimes a monarch with a lowly train, as in a spire with its pinnacles—the varieties of the arrangement are infinite: the law is universal. Have one thing above the rest, either by size, or office, or interest, and the rest subordinate to it as their relative size or office demands, or anything like proportion is an impossibility." Another sure sign of good architecture was change or variety—i.e., designing each portion, wall, roof, arch, door, or window with care and study, suiting its form, size, and decoration to its use and office in the building, thinking no part too mean to be deserving of the architect's best work, and as far as possible removed from the more generally accepted principle of making one detail drawing do for as many duplicates as possible—an arrangement of evident advantage in taking out quantities, but as evidently fatal to the architecture of a building. The work of the artist-architect should bear at every point traces and proof of the pleasure caused in the process of designing it. There was one class of buildings, of the first importance to engineers, that, according to Mr. Ruskin,† should never be decorated at all, but should be wholly devoid of anything like ornament. Why this sort of argument, however, should apply to railway stations more than to other buildings where business had to be transacted, it was difficult to discover. The next great consideration in obtaining effect in architecture was that of shadow and shade. On the right application of this law depended almost wholly the effect and explanation of grouping. The "power" of architecture depended almost entirely on the breadth and depth of its shadows. A walk round the cloisters of Westminster Abbey on any bright summer afternoon would show how much their effect depended on the broad masses of clearly-defined shadow. The foregoing were some of the guiding rules which conducted to the attainment of good architectural effect, but, as he had stated, the first great essential was common-sense, or Truth, meaning thereby the absence of anything approaching either to affectation or deceit—and this in the quality or nature of the material no less than in the amount of labour bestowed upon the work. "We may not" (to again quote Mr. Ruskin) "be able to command good or beautiful or inventive architecture, but we can command at least honest architecture. The meanness of poverty may be pardoned, the sternness of utility respected, but what is there but scorn for the meanness of deception?" Never to gain effect or to make work look quaint should this "meanness of deception" be resorted to; never to suggest a mode of structure other than the true one; and the surface of one material should never be painted to imitate the surface of another. If marble chimney-pieces could not be afforded, be content with stone, slate, or wood, but do not paint them to represent marble. In the case of woodwork, if mahogany or walnut could not be afforded, be content with deal, only let it suffice to varnish it, or paint it some inoffensive flat colour, instead of making people believe it was maple or wainscot oak by the use of the abomination known as graining. This principle of honesty was to be shown in many other ways, notably in the application of enrichments or decorations to returned or partially-hidden surfaces. In parts of a building bearing ornament it was not good architecture to stop it in portions only partially seen, unless some bold and openly-confessed termination was put, telling the spectator plainly that it did not stop, and not leading him to suppose that even the less prominent parts of the composition had been decorated. To have good architecture, one must start with all the circumstances and requirements of the building in view. For instance,

this window or that door demanded, from its relative importance, a certain amount of architectural treatment, which should be given it, not so much regarding its actual position in the building as the dignity of the functions it had to fulfil. This rule also applied to the "members" or component parts of the ornament, and we might always estimate its lasting value by the amount of rightly-directed labour spent upon it—for it was sympathetic labour that alone gave worth to ornament of any kind. There should be no decoration at all unless it could be had good, and to have it so time and skill must be expended upon it. Any attempt to reproduce ornament cheaply, and by means other than labour and thought honestly bestowed, was to be avoided wherever good architecture was required. A building might be ever so plain, and yet its architecture might be good in the highest sense of the word. Salisbury Cathedral was much nobler architecture than Henry VII.'s Chapel or the new Palace of Westminster, although the one was almost as devoid of ornament as the others were smothered with it. It might be safely taken as a principle that those portions of a building that derived the most interest from their form were those that could best do without superadded decoration. In the case of a series of pointed arches, for instance, it would be much better to let the arches depend for their interest on the curves to which they were struck, and to put such decoration as was at command into the otherwise rather uninteresting spandrel, than to have an elaborately-moulded and parti-coloured arch, and a perfectly dull and monotonous surface in the spandrel. The common practice, too, of having the capitals of columns so elaborately carved, in many cases where everything was plain, was a very great mistake. Given, then, all these tests of good architecture, in what style were to be found the largest number of them to put to ordinary use? His answer was our own English Gothic. Discarding copyism, after a careful study and attempt to discover the principles of common-sense and mechanical science in construction, and the correct application of ornament, architects should carry them out in their own work and practice. English architecture was the fitting companion and accompaniment of English engineering, and would be all the more so as it consisted of and rested upon that constructive science in the application of materials ready to hand which was the very essence of engineering.

A short discussion ensued, in which Mr. Pain (the President) Mr. Walmisley, Mr. Kingsford, Mr. J. B. Walton, and others took part, and a vote of thanks having been given to Mr. Rew for his paper, the meeting terminated.

SCHOOLS OF ART.

CORK.—The annual distribution of prizes to the successful pupils of the School of Art took place in the Theatre of Cork Institution on Tuesday week. The report for the past twelve months stated that the attendance at the school (which this time twelve-month showed a slight decrease as compared with the corresponding period of the preceding year) has increased considerably, particularly in the evening class. The total number of students who passed through the school last year was 188. This does not include an average attendance of 23 boys from National Schools, who attend the evening classes, receiving their instruction, and having drawing materials provided gratis for themselves, the National Board paying a small amount yearly for the instruction, &c., of each student.

AWARDS TO ART TEACHERS.—By a minute of the 3rd of January, 1868, the Lords of the Committee of Council on Education offered a number of money prizes to the head masters of the Schools of Art in the United Kingdom in which the general amount of work, considered with reference to the number of students under instruction, should be found most satisfactory. The prizes have now been awarded; and we find among the list of names the following:—W. J. Muckley, Manchester Royal Institute, £40. Charles D. Hodder, Edinburgh; D. W. Raimbach, Birmingham; and W. H. Sonnes, Sheffield, £30. Robert Greenlees, Glasgow; W. H. Stopford, Halifax; W. Cosensway, Newcastle-on-Tyne; Walter Smith, Bradford; Walter Smith, Leeds; R. C. Puckett, Ph. D. Leeds Mechanics' Institute, £20. T. C. Simmonds, Derby; Herbert Lees, Carlisle; John Bentley, Birkenhead; J. C. Thompson, Warrington; Susan A. Ashworth, Edinburgh; A. Stephenson, Keighley, £10.

During the removal of some old foundations at the rear of No. 76, Farringdon-street, a quantity of human bones have been brought to light. It is found that the spot forms a portion of a long-disused burial ground.

ARCHÆOLOGICAL.

WARWICK ARCHÆOLOGICAL SOCIETY.—The second meeting of the Warwick Archæological and Natural History Society took place at Warwick on Monday last, when Mr. Tom Burgess delivered a lecture on Warwick Castle in the time of the King-maker, "the last of the Barons." The lecturer gave a brief synopsis of the history of the castle, showing the development of the old fort of Etheldeda with the present princely structure; and illustrating the changes in military architecture by sketches. The historic portion of the lecture had especial reference to the Warwickshire legend of the Red Rose, and the lecturer described the celebrated tournament at Gosford Green, which heralded the feud of the Houses of York and Lancaster; the career of the great Nevill, Earl of Warwick, the King-maker; the fortunes of his daughters, the heiresses of Warwick Castle; and the building of the Bear Towers.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting on the 13th inst., Mr. Syer Cuming exhibited a rare specimen of an ancient Greek mask, in fine clay, for tragic plays, and some earthen crucibles of a Roman type lately discovered. Mr. Levien read a paper, communicated by Mr. Thomas Cole, of the discovery on the beach at Hastings of the trunk of a tree and some hazel nuts, in an all-but fossilised state, indicating the remains of an ancient forest, well known from other finds to have existed far out to sea on the south coast, as far as the villages of Pett and Fairlight from Hastings. Mr. Roberts then read his paper 'On Leominster Priory Church,' in which he sought to prove that the so-called nave of the church was intended for, and indeed was, the choir of the building. This result of his investigations and measurements he (Mr. Roberts) thought accounted for every one of the difficulties raised for various writers as to the original intention of this portion of the church. Mr. Roberts founded his theory upon this subject from drawings and plans he had made of the famous remains of Reading Abbey, which was the parent church, as Henry the First, in 1121, when building it, added the then small Saxon church at Leominster to its possessions, and afterwards was the means of a new monastery, in imitation of Reading Abbey, being erected upon its site. A further examination of some of the recently-discovered sepulchral urns took place, and Mr. Wright read a letter from Mr. Ashby, of Staines, who was still pursuing the investigation of the ancient cemetery at Ashford, to the effect that other urns had lately been dug up of a more finished form and ornamentation. These urns, it was mentioned, would be exhibited at the next meeting of the Association, on the 10th January next, to which date the chairman, in thanking Mr. Roberts for his paper, then adjourned the meeting.

ARCHÆOLOGICAL RESEARCHES AT EPHESUS.—The Chatham correspondent of the *Pall Mall Gazette* writes:—A number of the most intelligent and experienced non-commissioned officers of the Royal Engineers have been selected to proceed from the school of military engineering, Chatham, to Ephesus, for the purpose of superintending the excavations which are now being carried on, under the direction of Mr. Wood, for the trustees of the British Museum, to open up the Temple of Diana, a considerable portion of which has already been brought to light. Special permission for making the excavations has been obtained from the Sultan, and strenuous efforts are about to be made to bring to light the whole of the temple. Among the Royal Engineers who are about to be dispatched to Ephesus are some of the number who rendered such valuable service at Budrum, under the direction of Mr. Newton, when the tomb of Mausolus—which, like the Temple of Diana, was accounted one of the seven wonders of the world—at Halicarnassus, was discovered, and the statue of Mausolos forwarded to the British Museum. Under the direction of Mr. Murdoch Smith, the Royal Engineers were likewise employed in the recent excavations carried on at Cyrene, when a number of valuable Cyrenaic sculptures were discovered and placed in the British Museum. The Royal Engineers who are to be employed at Ephesus will receive, in addition to their ordinary pay, certain allowances and expenses, which will be defrayed by the trustees of the British Museum.

The parish church of Hullavington, near Chippenham, was reopened on the 7th inst., having been closed six months. During that time a restoration of the chancel, nave, and south aisle has been effected, under the superintendence of Mr. A. W. Blomfield. For want of sufficient funds it has been impossible to rebuild the tower, which from being in so dangerous a state, it was necessary to pull down; for the same reason the north aisle has only been repaired and made safe.

* See *BUILDING NEWS*, Vol. XX., p. 381.

† "Selections," p. 220.

Building Intelligence.

CHURCHES AND CHAPELS.

BALLYMONEY.—On the 19th ult. the First Presbyterian church, Ballymoney, Ireland, was reopened. The alterations made on the building have involved an outlay of £950. On the north side a new transept has been erected, thereby breaking that uniformity of plainness which previously characterised the structure, and providing extra accommodation for the congregation. A large window has been placed in each gable of main building, and all the old windows have been removed and replaced by others. Above the pulpit is a circular window having stained glass of various tints. The old ceiling has been removed, and the massive roof principals are now visible. The ceiling is finished in abaster, with an appropriate cornice. The exterior of the windows have freestone and Portland cement facings. At each of the principal entrances there is an overhanging porch. The architects were Messrs. Young & Mackenzie; the contractor, Mr. Moore, Belfast.

CHESTER.—On Monday the church of All Saints, Hoole, Chester, was consecrated by the bishop of the diocese. The church is built in the Transitional style of Gothic, by Mr. Hughes, of Aldford, from designs by Mr. S. W. Dankes, of Westminster. The cost has been about £6,000.

CRIFTINS.—The new church of S. Matthew, Criftings by Ellesmere, was consecrated on the Nativity of the Blessed Virgin Mary by the Bishop of Lichfield. The church is in the Early Decorated style, and consists of nave, transept, and apsidal chancel, with vestry, organ-chamber, bell-tower, and porch. The floor of the church is paved with encaustic tiles; the chancel stalls are of pitch pine, with carved ends and finials; the reredos is of Caen stone, enriched with green marble shafts, and has in the centre compartment an alabaster cross. The three windows of the apse will be filled with stained glass (from Messrs. Hardmans). The architect is Mr. W. G. MacCarthy.

DENSTONE.—The mission chapel of S. Luke, Stubwood, Denstone, has been completed. It consists of a nave and sanctuary, and, with the exception of the plinth, which is of brick and stone, is entirely of wood framing and plaster, the framing showing inside at well as outside. The windows of the nave have simple cusped heads; those of the sanctuary have traceried heads. There is no east window, but the wood framing is here treated more ornamentally. At the west end is a small vestry and porch, with bell-cot over. The floor is of wood, and the sanctuary has oak steps and floor. Mr. Stubbs was the builder.

HADLEIGH.—The interior of the parish church of Hadleigh, has been restored, from the designs of Mr. J. D. Wyatt, of Holloway. The old high pews have been replaced by new oak benches, with moulded and carved ends. The iron brackets, painted with bright blue and gold, which served to support the tie-beams of the nave roof, have now been cased in oak supports, which spring from carved stone corbels. The roofs of the north and south aisles have also been repaired with timber braces, and stone corbels have been inserted where they were required. The stonework of the piers of the nave was in an unsatisfactory condition in many places, and those defects have been remedied, and the mouldings of the capitals of the piers repaired. The two chapels at the east end of the chancel aisles, separated from the church by ancient carved oak screens, have been repaired and restored, the most noteworthy part of the work being the restoration of the cresting or brattishing. Accommodation is provided for about 1,000 persons, and the total cost of the work is about £1,000. Mr. J. A. Pettitt was the builder.

LIFTON.—The parish church, Lifton, was reopened on Thursday week, after restoration, and new school-rooms in connection with the church were opened at the same time. The works in connection with the restoration of the church were carried out by Messrs. Bullen & Bevan, of Lifton, from the plans of the architect, Mr. Hooper, of Hatherleigh. The church has been thoroughly renovated and reseated. The seats are open and of pitch pine. The chancel has been fitted with stalls and seats for clergy and choir, and a reredos of Caen stone provided.

STALYBRIDGE.—S. Paul's Church, Stalybridge, is to be enlarged. It has present accommodation for 1,000, but as neither pews nor sittings are to let, although there is an active demand for both, it is proposed to give 500 additional sittings. The works, which will cost about £3,000, are to be commenced forthwith. Mr. W. H. Brakspear, Albert-square, Manchester, is the architect.

BUILDINGS.

ALCESTER.—Ragley Hall, near Alcester, the property of the Marquis of Hertford, has just been restored. A large portion of the west front was found to be untrustworthy, and was taken down and entirely rebuilt. Mr. W. Tasker, of London, was the architect, Messrs. Clark & Smallwood, of Wooten Wawen, being the contractors.

ARDWICK.—The new S. Matthew's middle-class schools, Ardwick, are completed. They are built of bright red brick, with Yorkshire stone dressings, from plans prepared by Messrs. Medland & H. Taylor, of Manchester. Over the fireplaces in the two school-rooms are panels of a large size, which are to be occupied by paintings in oil, representing "Caxton in Westminster Abbey," and "Palissy, the potter." The internal doors are panelled with framing. Accommodation is provided for 430 children. Messrs. Robinson & Son, of Hyde, were the builders.

DORKING.—The foundation-stone of a new public hall for Dorking was recently laid by Mr. Cubitt, M.P. The building is in course of erection by Mr. W. Shearburn, contractor, from a design by Mr. C. H. Driver, architect, of Westminster.

MILES PLATTING.—The new S. Luke's Schools have just been completed by Messrs. Rutherford & Darnbrough, from the designs of Messrs. Medland & H. Taylor, of Manchester. The cost has been about £2,400 for an accommodation sufficient for 516 children. The building is of red bricks, with dressings of stock bricks, in arches, bands, the tympanæ of the doors, &c., and a little stone.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

RECEIVED.—J. H. C.—E. W.—C. B. A.—W. & Sons.—C. L. E.—T. R.—A. H.—P. W.—C. B.—W. L.

ENQUIRER.—Another correspondent, as you may see, asks similar questions about the Camborne Villa.

CONYBEARE.—The company is wound up.

AN INTENDING COMPETITOR.—The instructions mean exactly what they say, "That each set of plans, elevations, and sections to be drawn on a single sheet of imperial."

S. NOBLE.—The illustrations are not sold separately.

Correspondence.

VILLA RESIDENCE, CAMBORNE.

To the Editor of the BUILDING NEWS.

SIR,—In looking over your excellent paper of the 8th inst., I was much pleased with Mr. Hicks's design for a country villa residence at Camborne, which, from casual observation, appears to have been well considered, both as regards the internal arrangement and external appearance, but having roughly cubed up its size, I am at a loss to find how such a building, with the fittings, &c., completed, can be erected for the low sum of £1,350, which at per foot cube is far below what you allow for the villas in your competition plans. I waited your last week's issue before making this comment, supposing that either the architect or contractors would have corrected the statement, as I cannot help thinking that there must be an error somewhere of at least £500 in the cost, or else materials and labour must be very cheap indeed in that part of Cornwall.—I am, &c., S. H.

CAMBERWELL VESTRY-HALL COMPETITION.

SIR,—It will be interesting to those of your readers who have been foolish enough to send designs for this building to read the result. From twenty-four designs sent in, a committee selected eight; seven of the mottos I give, but the eighth has slipped my memory. The seven are as follows: "Experience," "Well Considered," "Thorough," "Excellior," "In Foro," "A Lœuvre on Connait l'ouvrier," and "Cives." These were under consideration at a vestry meeting held on Wednesday evening last, for the purpose of selecting the designs which should receive the first and second prizes. Almost before the report

of the committee had been read, it was evident that a large party in the vestry had come with a pre-determined resolution to adopt the two designs marked "Cives" and "Well Considered," two of the most expensive and flashily-got-up designs in the room.

It leaked out that these had also been thought of by the committee, but having had them cubed up, and finding the cubic contents of each to be 360,000ft., and that they were estimated by their surveyor to cost at least £12,000 each, in lieu of £8,000 as stipulated, the committee became alarmed, and resolved to throw the responsibility of the transaction upon the vestry.

It may be easily imagined that the surveyor, desirous of pleasing his committee, would not exaggerate the estimate; and any person with the slightest experience in building, could, at a glance, see that such work as is shown could not be executed under 10d. per foot cube. Both the designs show buildings faced with Portland stone upon two fronts, the aggregate length of which is 150ft. and the average height about 40ft.; both the elevations are decorated in the most lavish manner, whilst the internal finishings are quite in accord with the exterior.

Taking 10d. per foot cube as the least cost for which the designs could be carried out, with the heating apparatus, lighting, &c., required, even after being cut down in their decorative parts, it will be found that the cost of the building is as follows:—

360,000 cube feet at 10d. ...	£15,000
Architect's commission	750
Clerk of works' salary, say	
52 weeks at £4 4s.	220

Total £15,970

In addition to this, the sundry expenses not directly chargeable on the building would bring the cost considerably over £16,000. Now, on the face of this, I as one of the competitors (looking at the fact that the conditions issued by the Board strictly stipulate that the cost of the building, together with offices, fittings, warming, ventilation, lighting, drainage, architect's commission, and clerk of works' salary, shall not exceed £8,000) protest most strongly against the utter dishonesty of the proposed decision.

A large number of architects have been lured on to give their time and money (and to run the risk of losing both) upon certain specified terms, and the vestry are the first to break the contract.

I submit to my unfortunate professional brethren that here at least we have a case of such flagrant outrage upon all principles of equity and justice that should the matter be decided in the manner fore-shadowed we should associate together instantly, and take the necessary legal steps in a court of equity to compel the vestry to compensate us for the time and money wasted on their behalf. In this I venture to say we shall be supported by the whole of the profession, who will be only too happy to subscribe towards the cost of providing such an example as will not be forgotten for a long time to come by parish boards who ruthlessly put architects to ruinous expense in competition, simply as a cloak to their desire to give work to their friends. It will go far towards this result if the very strong rumour that the authors of the selected designs are Camberwell practitioners, turns out to be fact.—I am, &c.,

ONE OF THE UNFORTUNATE SIXTEEN.

NEW COURTS OF JUSTICE.

SIR,—In reference to a statement of a correspondent in your paper, that ninety-nine per cent. of the provincial architects would concur in the condemnation of Mr. Street's present design—a statement which is described by your correspondent, "A Provincial Architect," as "dishonestly untrue"—I beg permission to state that among rather an extensive circle of professional acquaintances in one of the largest towns in England, I have not met one who did not speak of it in terms not merely of condemnation, but of utter astonishment that an architect of Mr. Street's reputation and known ability should put his name to so poor and commonplace a design, so far as we can judge from the published engravings of it; and I have seen the same sentiments expressed in writing by provincial architects of other districts, one or two of whom have much more than a provincial reputation. In fact, so far as my experience goes, this feeling is universal in the provinces.

Like "H," we do not wish to see Mr. Street "sided," but for his own reputation, as well as that of English architecture in this century, we hope he will be induced to reconsider his design. As to any personal feeling towards Mr. Street influencing the general dislike to his design, that is simply nonsense. I have heard this dislike expressed by those who not only could have no grudge against him, but were

among his professed admirers (as I am myself), and also by those (for there are a few such even among modern English architects) who would be incapable of letting personal feeling influence their judgment of a design. Of the style and manner of the "Provincial Architect's" letter, I will only say that if he is one of Mr. Street's friends, that gentleman may well echo the old proverb, "Save me," &c.—I am, &c.,

ANOTHER PROVINCIAL ARCHITECT.

HOUSE DRAINAGE AND SEWER VENTILATION.

SIR,—To ensure perfection in house drainage it is not enough that the drains should be made of glazed earthenware carefully put together and cemented, but they should be laid in a brick trough and be covered with stone, or where such expenses can be afforded, they should be made of iron flanged pipes, screwed together, with the joints caulked. In the case of ordinary glazed pipes the least inequality in removing the soil will crush the cement joints and allow the escape of the sewer gas.

Unless siphon bends are used, the ordinary sink trap with a dipstone is often a mere delusion, as the least jar will crack the cement round the top stone, and the same cause, or careless workmanship that cannot be seen, will do the same for the junction of the dipstone with the cover, and even when air-tight the water in it is not clean but foul water, and in case of sediment the trap itself gives off sewer gas.

It is difficult to make an air-tight joint with cement between the lead pipes and the sink traps or siphon bends, and the same difficulty, though in a less degree, is true of junctions between iron and lead pipes.

Rats will sometimes gnaw holes through lead soil-pipes, and after many years' use they are liable to a corrosion that will eat them through, and from their situation they are difficult and always expensive to renew.

The water traps to water-closets, washhand-basins, sinks, to the waste-pipes of cisterns, if unused for long, will dry up, and the gas so escaping may fill the closely-shut closets in which they are placed, and gain entrance to living or sleeping-rooms beyond.

It is, therefore, evident that the greatest care should be taken to have water-closets, plug washhand basins, sinks, cisterns, &c., in closets cut off by walls or partitions from living and sleeping rooms, and each closet should have constant ventilation that cannot be shut off; but in winter this communication with the outer air is unpleasant, and sometimes dangerous to persons using such closets, and increases the liability of the pipes and cisterns to freeze.

When all the precautions named have been adopted, there are still two sources of danger—viz., the want of proper sewer ventilation, and the want of a proper supply of fresh air for the fires.

Where the sewers (of which there are many in London) drain into a tidal river, the flaps are wholly or nearly closed at high water, and the accumulating water forces the sewer gas up the vents or house drains, and, where the pressure is sufficient, through every trap in every house. Where the sewers are not in connection with a tidal river, the sudden access of water from storm rain water or from other causes will have the same effect.

It appears from Mr. Haywood's letter in the *Times* that Parliamentary Committees have been sitting on this subject for forty years, but nothing has yet been done.

It is agreeable to find from Dr. Letheby's letter that the steam we see curling up from the sewer ventilators, and the smell that greets us, is not unwholesome when it has passed the charcoal filters; but it is not so reassuring to find that only one small area of the city is so treated, and the public are recommended to take their own precautions against corporate neglect.

No reasonable person can doubt that furnaces with high chimneys at short intervals would ameliorate if it did not cure this most potent cause of the evils we endeavour to avoid.

In addition to this, the want of air supply for house fires causes exhaustion of the air in close-shut rooms, passages, and staircases, and thus draws sewer gas from any crack in the drains or from holes in soil or waste-pipes connected with them. There should be a pipe from the external wall to every fireplace, bringing in fresh air, to be warmed by a chamber at the back of the grate and then passed into the room; there should also be a spare flue for carrying away the consumed air of the gas and the superheated and vitiated air of the room.

Of Mr. Gibsons's scheme it is unnecessary to speak at present, as our sewage system does not admit of its application; few houses have less than three fires alight at once in the winter, and each fire requires a

9in. pipe to carry away the smoke; few houses have more than one 9in. drain pipe for the sewage. Hence the present drainage system is insufficient.

Unless your advocacy is used to force proper sewer ventilation to be carried out now when public attention is turned to it, we shall have Parliamentary committees sitting on it forty years hence.—I am, &c.,

G. AITCHISON.

5, Muscovy-court, E.C.

SIR,—In reference to your article on this subject, I would beg to call attention to the necessity for intercepting the influx of gas from the main sewers by a double long siphon or double dip trap on the main house drain, with a small pipe from the central space run up the wall to deliver away from all windows. I have used Cottam's patent intercepting trap with very good results, and I believe that Messrs. Doulton make a double long siphon in ordinary drain-pipes with a cap or cover at top of the central rise. In several buildings recently executed I have built 4in. drain-pipes into the walls as fall pipes, untrapped from the drain to cesspool in roof gutter; the mouth of the fall pipe being within the parapet is far removed from all windows. A pipe of this diameter gives ample scope for the upflow of sewer air, as the falling water clings to the sides of the pipe. This arrangement would not be applicable to a roof with dripping eaves. In building drain pipes into a wall it is necessary to be quite safe against settlement or fracture, and to have the pipes free from all projections or sharp curves, and to provide easy access to the feet in case inspection is necessary. In reference to drains, it frequently happens that they are over-trapped, and the emanating gases soon accumulate in the confined spaces in sufficient volume to force an ordinary water trap.—I am, &c.,

THOS. CHAS. SORBY.

27, Brunswick-square, Dec. 19.

SIR,—Your article upon this subject at p. 445, is worthy not only of serious consideration, but also of being followed up. The subject is one which I have had my attention often drawn to, and if you will permit me, the following is a short sketch of my ideas upon the matter, which I have also seen practically carried out, viz.:—Upon the drain leading out to common sewer in street, place a tile cesspool of the necessary size, and see that it is properly laid—not as I have seen, when you could pass a lighted candle in at one end and out at the other, and it burning all the time! Also have all the joints of drain or tile pipes properly jointed with something more than a farthing's worth of cement on top—where it catches the eye—and none at bottom. Then join the soil-pipe, waste-pipes, &c., properly and securely to drain, and seeing also that all joints on soil-pipes, &c., are also secure, and carrying up a ventilating pipe from top of all soil and waste pipes up to roof, and as far as possible from windows, so as to give proper ventilation, and so prevent the action of a water-closet from sucking out the water from the traps or cesspools of the washing-basins in bedrooms, or from the jaw-boxes, &c. Likewise see that any bell-traps which may be upon the overflow pipes of cisterns are not mere egg-cups, but properly-constructed self-acting ones. In short, see that both the plumber-work and drains are done in the way they should be, and that the plumber knows what he is doing. It is an old-fashioned way to lock the door after the steed has gone, but sensible people will see danger at a distance and prevent its approach by using the proper means to do so. In cases where it is years since anything was done to the drains or soil-pipes of a house, it would be well to have an examination by some good plumber, especially if a bad smell is sometimes felt in the house. In some cases all the cesspools may be right, but owing either to the want of a ventilating-pipe or to some other cause there may be holes eaten through the top or sides of the soil or waste-pipes, and although there may be, as there often is, no water leakage, still the foul air leakage may sometimes be enormous and highly injurious; while in cases where the bell-trap of a cistern is not self-acting, and there has been no plumber near it for months or years, it may be quite dried up, and as a consequence both the water near it and the air of the house can be contaminated by it. So far as my experience goes, it is sometimes very difficult to get drains properly laid. I remember two cases where the orders given were to make the things as good as possible at whatever necessary expense, yet I could not get the masons to come up to the scratch; they actually grumbled to use the cement even, although paid for it; and one answer I got from a mason of forty was, "If we were to do everything the way you want us, there would not be work for us all."

As to your remarks about Londerborough Lodge, I half wish I was able to see it, as there are several points you do not refer to, and I cannot agree with you that rain-water pipes should not be used for ventilating, for I would use them if there were no windows near.—I am, &c.,

PLUMBER.

COMPETITION FOR HOUSE PLANNING.

SIR,—The conditions of this competition are so liberally and judiciously drawn that they cannot fail to satisfy the vast majority of those interested in the

movement. There is, however, one point to which I should like to refer—namely, the estimated cost of the designs. The detached villa, the dimensions of which will not exceed 50ft. square, is supposed to cost 8d. per foot cube, and the mansion (the size of which will not much exceed 50ft. by 100ft.), is estimated to cost 1s. per foot cube. These figures of cost are exceedingly high, so much so that they would probably frighten any client out of the designs. Besides, there is no substantial reason why the mansion should cost only a trifle more per cubical contents than a detached villa. You have, before now, done me the honour of publishing some of my designs, the cost of which has not, in any case, for tolerably large buildings, exceeded 4d. per foot cube, and very frequently my buildings fall under that figure. However, it is always wise to give large estimates at first, and the costs you have decided upon will allow ample means for indulging in decorations of almost every kind. The original competitors for the Law Courts mentioned from 10d. to 1s. 1d. as the probable cost of that important work, which will certainly be more expensive than ordinary villas or mansions.—I am, &c.,

H.

SIR,—In clause 5 no mention is made of "Attic" plan. I presume there can be no objection to any competitor arranging attics as servants' bed-rooms, &c., in either design.—I am, &c.,

J. B. CORREY.

[Certainly not.—Ed.]

THE ROYAL ACADEMY PRIZES.

SIR,—Be good enough to correct an error made in your last week's critique on the Royal Academy prizes. The unsuccessful design for the travelling studentship, "Dum spiro spero," which you attributed to Mr. Wornum was the work of the successful competitor for the Gold Medal, Mr. W. Galsworthy Davie. The Classic design, "Bruce's Spider," was the one submitted by Mr. Wornum.—I am, &c.,

H. T. KEATES.

THE CAMBERWELL VESTRY-HALL.

SIR,—The exhibition of selected designs for the above is highly calculated to awaken feelings of the most intense disgust. First, that so many members of what ought to be an honourable profession can resort to such unworthy means to attract attention to their designs; and, secondly, that a committee of what ought to be an intelligent and respectable body can be so ignorant or ill-disposed as to neglect the plainest principle of justice in their selection and exhibition. There is no excuse for the architects; there is possibly some for the committee, and there is a ray of hope left in the consideration that the Vestry, at its last meeting, refused to adopt the recommendation of the committee. In the almost forlorn hope that some principles of justice may yet be recognised in this matter, I have addressed the following letter to the Vestry Clerk, and it may deserve publication in your columns.—I am, &c.,

A COMPETITOR.

(Copy.)

SIR,—Referring to the designs now under consideration for the proposed Vestry-hall for the parish of S. Giles, Camberwell, allow me, through you, to call the attention of the Vestry to an irregularity connected therewith, which, if not corrected, is likely to prevent a just and beneficial selection from being made.

In the printed instructions to the competing architects it was distinctly laid down by authority of the Vestry that "the drawings were to be limited to plans, elevations, and sections," the scale also being strictly prescribed—a very proper and judicious regulation, obviously intended to secure that each design should be equally represented.

In defiance of this regulation, many of the competitors have sent (besides the "elevations, plans, and sections") coloured perspective views, taken from the most favourable points of view that could be selected, and finished in a showy and attractive manner, so as set forth their designs in a more favourable way than was allowed by the instructions.

The usual and fair course to meet such disregard of the instructions is to reject all drawings that do not comply with the regulations, and only exhibit such as are in conformity with them. But, to the astonishment of all who are any way conversant with such matters, of the eight designs now selected and exhibited, five or six are distinguished by having thus violated the rules, and the drawings which have been submitted in excess of the prescribed limits are hung in the most prominent positions, and evidently from the strongest recommendation to the designs to which they refer.

It is perfectly clear that by this line of procedure a premium is placed upon disregard of the conditions, and the architects who have observed them are placed at a most unfair disadvantage.

Every architect knows well that no fair comparison can be instituted between ordinary elevations and perspective views. The same design would look very different according to the manner in which it is represented. An inferior design may be made to look showy and attractive by a favourably-managed perspective view; whereas a really superior design will often appear stiff and formal when only shown by elevations.

I trust it will be only necessary to direct attention to this matter to secure that it shall be at once rectified, either by excluding from the exhibition all drawings sent in excess of the instructions; or, if it be preferred to admit them, that an extension of time should be given, sufficient to allow those architects who have hitherto adhered to the instructions to prepare addi-

tional drawings of corresponding character, so that all the designs may be equally represented.—I remain, Sir, yours most obediently,

A COMPETITOR WHO HAS ADHERED TO THE INSTRUCTIONS.
London, December 19, 1871.

SIR,—I see by a notice, published in your journal of last Saturday, that eight designs of the above have been selected for public inspection, from the twenty-four sets that were sent in. Why are they not all exhibited? This apparent jobbing is in striking accordance with a very suggestive statement, published in your journal some weeks since, wherein a group of gentlemen were overheard conversing at a street corner, concerning the personal interest that some of the vestrymen had in a few of the designs. Are the eight selected the designs that have received such enviable patronage from these Jacks-in-office? When are competitors to be honourably dealt with? I would suggest that the authors of all the unexhibited designs zealously protest against this underhand business, perpetrated by these shopkeepers, and insist upon justice being done them by having all the designs exhibited, and not a favoured few.

If the Vestry-hall is to be built with public money, the public have a right to form an opinion upon the subject as well as the butchers, bakers, and candlestick makers of the neighbourhood, and see for themselves that the selection is a just one.—I am, &c.,

VERSUS.

ORNAMENTAL BRICKS.

SIR,—Our friend "Samson" is apparently a chip of an old block, who would rather suffer anything than allow an innovation. He may be a manufacturer of cements, a decorative painter, or one of those rightly-named plasterers, and therefore would rather see a continued production of the tame samenesses that strike you with a chill to look at, instead of instilling warmth, life, and animation, as it were, into these subjects. He may never have seen these bricks; he is not the only one by many thousands. If he has never seen a specimen of the material, what has he done with his boyhood? Did he never sport a brown in common toy marbles in red and buff? Did he never have a game at knuckle-down? If not, will he be kind enough to sport one halfpenny for a score of those articles? They are made from the same material, though far from a good specimen. Variations like those, if judiciously arranged, would form a pleasing contrast to the present system of plaster. When I tried to introduce the idea some thirty years ago, when engaged upon the materials for the construction of a church in Surrey, nothing would do but black headers and white and red stocks; any mixture was counted spoiled. If you will look again you will see that it is not to go in for chimney-pieces, washhand tops, &c., and the imitation proceeds no further than the veined mixture, not as imitation of natural products. There is no sham about it, not even the varnish that you presume, which never showed itself in all my experience. In various models I produced years ago the bricks were moulded and burned as ordinary bricks in clamps and kilns. What Mr. Ransome's experience and experiments led him into, I know not; but at the same time, I made grindstones and whetstones, or rubbers for scythes and hooks for many farm labourers, as well as toy marbles for the small fry, and these bricks are moulded and fired as true as ever you surfaced a cutter by grinding.—I am, &c.,

JACK OF ALL TRADES.

ASPHALTE FOR STREET PAVEMENTS.

SIR,—Like "A Man in the Streets," in your last number, "I should rejoice if asphalt were found superior to granite, or any other paving material;" and in many respects it no doubt is. There is another item of expense in connection with asphalt which was not mentioned, if I remember correctly, in Mr. Haywood's elaborate report. I remember one day about four or five months since, when passing Leicester-square, seeing policemen stationed at each end of the asphalt pavement, then recently put down, to caution all drivers to drive slowly as they went over the asphalt. This precautionary measure was, I found, quite necessary, as the horses were falling in every direction, and no doubt if the policemen were not there more would have fallen. Who paid the policemen? Not the company who put down the asphalt, I suppose, but the public. It would have been well if Mr. Haywood had inquired into all the facts of asphalt, and this one with the rest. I should say that, at the time I allude to, the asphalt was neither wet nor dry; it was just after a shower of rain, and the road was unusually slippery. It was one summer evening, when a lot of the West-enders were wending their way to the Opera, and I suppose because the limbs and the lives of some of the "upper ten" were involved, that the precautionary measure alluded to was taken. I said then, and I say now, "Let the Prince of Wales's horses fall one day over this asphalt in Leicester-square, or, in fact, those of any other member of the royal family, and the pavement will be taken up much more rapidly than it was put down." Such is the way we do things in this country!—I am, &c.,

ANOTHER MAN IN THE STREETS.

GATESHEAD SCHOOL COMPETITION.

SIR,—In last week's BUILDING NEWS "Competitor" proposes that the notes by "An Architect" on the rejected designs in the above competition be published. As "An Architect" has not responded, may I, as

another competitor, ask him to do so? Being rather inquisitive about the design he pronounces, in a word, "absurd," I should like him to give a short description of it, with or without the initials of the author, as he thinks proper.—I am, &c.,

ONE OF THE SELECTED ONES.

Intercommunication.

QUESTIONS.

[2407].—Pollard Oak.—Can any reader inform me where good figured pollard oak can be purchased? I have tried several large firms in London without success.—W. R. A.

[2408].—Jacobean Details.—Will some enlightened subscriber furnish a list of the best works on Jacobean detail in wood, and brickwork, &c.?—HOLBEINER.

WATER SUPPLY AND SANITARY MATTERS.

SEWER VENTILATION.—Mr. J. P. Seddon, in a letter to the *Times* says:—The most common and insidious mode by which sewer gas escapes into dwellings, and in all probability the mode, if any, by which it did so at Londesborough Lodge, seems to have been overlooked by those who have written in your journal on the subject, including myself, and as, fortunately, it is not difficult to counteract this, I desire to repair the omission. Where the soil-pipe enters the house, contraction and expansion are likely to render defective the stopping up the joints, and the casing round the pipe forms a channel up which the gas rises, outside the pipe, until it finds a passage through the joists of the floors and is drawn in by the fires in rooms, often at a distance from the closet or any obvious cause for such evil, to the astonishment of the inmates. The remedy for this is to continue this channel up to and above the roof, and to cut off all lateral communication from it with the floors; any possible escape will thus be rendered harmless. As soon as there is any suspicion of an escape in a house, such channels should be examined and the above precaution taken, in addition to others that have been recommended.

WAREHAM.—A correspondent of the *Daily News* writes:—"The recent discussions on sanitary matters embolden me to hope that you will give publicity to the horrible conditions under which the inhabitants of this town live and die. The drainage here is *nil*. None of the houses in the place have water laid on. Our churchyard is so crowded that it is a regular thing to dig up old corpses to make place for new ones, and to replace old and new together. Sewage, and blood from the slaughter-houses, lie in our streets for days together; and typhoid fever rages in our cottages from year's end to year's end. Our local authorities are perfectly aware of all this, and do nothing to remedy it; and I want to know whether or not there is any central authority in London which can be induced to help us. The Dorsetshire labourer has had his turn of public sympathy; may not the Dorsetshire townsman count on obtaining his, when he suffers from the accumulation of horrors which is poisoning the blood and shortening the life of every man, woman, and child in Wareham?"

SALFORD.—A statement, the serious importance of which cannot be exaggerated, occurs in a recent report of the Salford Borough Surveyor. After specifying five main sewers that have been re-laid during the year ending August, 1871, Mr. Bowden says:—"I regret that more has not been done in renovating the old sewers of the district, when I recall to remembrance the facts stated in my report upwards of two years ago—viz., that there are 90 sewers which contain from six to 36 inches of deposit." Can any one wonder that Salford has the unhappy reputation of having one of the highest death-rates in the country after reading such a statement as this?

DRAINAGE OF THE THAMES VALLEY.—At the Court of Common Council on Friday last the Court passed a resolution to the effect that notice having been given of the introduction of a Bill into Parliament to sanction a scheme of Mr. Bazalgette for the drainage of the valley of the Thames, it be referred to the Commissioners of Sewers and the Gas and Water Committee, with power to confer together to investigate the scheme, especially as to the manner in which the drainage from the proposed sewage farm may affect the water supply of the metropolis, and to report thereon to the Court, with any recommendations as to the action the Corporation might take in the matter.

Mr. William R. Cnsack-Smith has given £1,000 to the S. Paul's Completion Fund.

At the last meeting of the Metropolitan Board of Works, a letter was read from the General Post-office, suggesting that the Board should insert a clause in the Bill for amending the Metropolitan Buildings and Management Acts, making it compulsory on builders of new premises or owners of premises in course of re-erection to provide letter-boxes. The subject was referred to a committee.

Our Office Table.

THE DESIGNS FOR THE NEW LAW COURTS.—We last week published a letter from the President of the Institute announcing Mr. Street's intention to allow any of the members of that body to inspect the designs for the New Law Courts to-morrow (Saturday), on the site in Carey-street. The time mentioned in Mr. Wyatt's letter was three o'clock. We are requested to state that the designs will be open for inspection from twelve to three to-morrow.

THE NATIONAL GALLERY.—The *Athenæum* states that Mr. Wornum has ceased to reside in the official apartments of the National Gallery, which are considered to be fireproof; "an unmarried policeman" is to occupy these quarters by way of precaution against fire. Meanwhile, the Keeper of the Royal Academy continues to occupy his residence, which is attached to the old Royal Academy premises, at the eastern end of the same building, under the rooms which are not fireproof, and *en suite* with the western part of the gallery; in the eastern end are nearly all the more precious pictures of the national collection.

SOUTH KENSINGTON MUSEUM.—A beautiful silver cup, the work of Jamnitzer, the Nuremberg goldsmith and contemporary of Cellini, has just been added to the art collection. The Educational division has lately received a very curious toy house made in Nuremberg two centuries ago, filled with models of utensils of the period, illustrating German life and manners. It is at present shown in the North Court. Mr. William Smith's gift of water-colours will be exhibited as soon as the room is prepared to receive them.

BRITISH ARTISTS' PROTECTION SOCIETY.—On Wednesday evening a meeting of artists was held at Duke-street, S. James's, Mr. Arthur A'Beckett in the chair, for the purpose of forming a society for the protection of the works of artists at exhibitions. Several works of art having been found to be damaged or lost at the late International Exhibition, and no redress being capable of being obtained from the Commissioners on account of the conditions issued by them, it has been deemed necessary to start a society which should watch over the interests of artists, with a view to secure to them generally, by co-operation, that which it would be impossible to attain by individual action. After a long discussion, in which the grievances which artists suffered at exhibitions were fully discussed, together with the fact that her Majesty's Commissioners for the Exhibition of 1872 had not altered the conditions of 1871 for the reception of works in 1872, it was resolved that a society should be formed, to be called the "Literary and Artistic Association," having for its object the protection and defence of the interests of writers and artists of Great Britain. The terms of subscription were then settled, and the meeting was adjourned to a future date, when the formation of a committee and other matters will be taken into consideration.

DEATH OF HERR KRANNER.—At a recent meeting of the Royal Institute of British Architects, the death was announced of Herr Joseph Kranner, architect, of Prague, and latterly of Vienna, who had been an Honorary and Corresponding Member of the Institute since 1850. Herr Kranner's chief works were the buildings of the Austrian "Lloyds," at Trieste, the monument of the Archduke Charles, at Vienna, and that of the Emperor Francis I. at Prague. In 1851 he was called to Vienna to remodel the School of Architecture and to supervise the art classes in the higher schools in that city. He superintended the restoration of Prague Cathedral, and latterly was executive architect to the Votive Church, carried out from Professor Ferstel's design. Herr Kranner died at the age of seventy.

CLERKS FOR THE LONDON SCHOOL BOARD.—The London School Board are advertising for a Clerk of the Works, with a salary of £3 per week, and a Writing Clerk, able to write short-hand, at £80 per annum. Applications must reach the Clerk of the Board before the 6th of January.

NEWCASTLE-ON-TYNE SCHOOL BOARD.—Mr. Thomas Oliver, Newcastle; Mr. R. I. Johnson, Newcastle; and Mr. F. R. N. Haswell, North Shields, have been appointed the architects to the Newcastle-on-Tyne School Board.

SLAG CEMENT.—A good cement can be made, it is said, from the slags of the blast furnace. The composition of the slags should be for the most part as follows, to obtain from them a good cement. Essential elements: silicic acid, 40-21; clayey earths, 15-13; calcareous earths, 36-24. Non-essential elements; manganese, oxide of iron, alkalies, &c., 8-35.

One part of these slags in fine powder is sprinkled, and agitated in a suitable vessel, with two parts of an equal mixture of hydrochloric acid (35 per cent. HCl) and water. The slags decompose, a lively disengagement of HS taking place. The mass finally forms a thick jelly, from which water removes the chlorides completely. After removing these, the residue is dried and reduced to an impalpable powder: one part of this powder, intimately mixed with nine parts of slag in powder, makes a good cement in either water or air.

AMERICAN "GOTHIC RUINS."—It has often been made a matter for complaint by English travellers in the United States that America contains no Gothic ruins. Chicago had some twenty churches in the Pointed style; a large number have been burnt in the recent conflagration. *Harper's Weekly*, the "Illustrated News" of America, gives views of the remains. They are most refreshingly picturesque. Cannot the Chicagoans leave them as they stand, and plant ivy about them, as an instalment of ruins for posterity? One in particular, according to the *Guardian*, bears a strange resemblance to an English abbey destroyed under Henry VIII. It is the shell of the "Second Presbyterian Church." The ruins of the Romanist "Church of the Holy Name" are almost equally fine. In reality the future effect of these buildings will depend upon whether they were of stone, or, as in the case of most similar meeting-houses in our own country, of lath and plaster. Surrey Chapel, or the church in Swallow-street, would make but shabby Gothic ruins.

CHURCH EXTENSION.—The usual monthly meeting of the Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels was held on Monday at 7, Whitehall, S.W. Grants of money were made in aid of the following objects, viz.:—Building new churches at Brandon, in the parish of Brancepeth, Durham; Kennington (S. John the Divine), Surrey; Lesney Park (Christ Church), in the parish of Erith, Kent; Redditch, Worcester; Stoke Newington (S. Faith), Middlesex; and Worleston, in the parish of Acton, near Nanturch, Cheshire; enlarging or otherwise increasing the accommodation in the churches at Dunterbourne, near Cirencester; Monkwearmouth, S. Peter's, near Sunderland; and South Leigh, near Witney, Oxon. Under urgent circumstances, the grants formerly made towards building the churches at Ryde, Isle of Wight; and Silloth, S. Paul, Cumberland; rebuilding the church at Llangain, near Carmarthen; and towards reseating and restoring the church at King's Pyon, near Weobley, Herefordshire, were each increased. The society likewise accepted the trust of sums of money as repair funds for the churches of Leeds, S. Mary, and Redwick, Monkwearmouth. Attention is asked to the numerous appeals soon likely to be made to the committee for aid, and to the recent scarcity of donations to its funds.

"FIRST CLASS BOARDING-SCHOOLS."—Mr. Buckmaster, connected with the Department of Science and Art at South Kensington, brought under the notice of Mr. Chance, at the Lambeth Police Court on Tuesday, a case which required publicity, he said, to put parents and guardians on their guard how they sent young ladies to boarding-schools. His statement was that a young lady, who had been tenderly brought up, was sent from the country to a young ladies' boarding-school of some reputation in that district, where the terms varied from 60 to 80 guineas a year. About a fortnight ago the young lady was ill with a cold, which turned into a congestion of the lungs. She was sent to a dirty cottage, without furniture except a bed, and put into a damp bed with damp sheets, and she died last Friday. The applicant said the cottage was unfit, from sanitary defects, for human habitation; the paper was rotting off the walls, mildewed, and damp. The applicant thought it was the duty of parents and the public, when they sent their children to grand boarding-schools, not to be content with seeing the drawing-rooms, but to see where the young ladies were to be lodged when taken ill. He thought that there should be an inspection and certificate given of good sanitary and domestic arrangements. Mr. Chance, on Mr. Buckmaster leaving a statement with him said the press would perhaps notice the application. It was a serious matter.

DEATH OF MR. GEORGE HUDSON.—The death is announced of Mr. George Hudson, the "Railway King." Mr. Hudson was born at York in March, 1809. He was apprenticed to a firm of York drapers, and afterwards attained the position of a master in the same house. In 1837 he became Lord Mayor of York, to which office he was twice re-elected. Mr. Hudson's first connection with railways was in 1833, when he took a prominent part in preliminary meetings then held in York to promote a line of railway communi-

cation with the city. Mr. Hudson had for several years past lived upon the interest of £1,800, which had been collected and invested by his friends.

CHIPS.

Mr. Thomas Shelmerdine has been appointed "Land Steward and Surveyor" to the Corporation of Liverpool, at a salary of £700 per annum.

The Metropolitan Board of Works require £223,252 for the forthcoming year, to be levied by a rate of 2½d. in the pound on a rental of £19,971,281.

The Stock Exchange is again about to be considerably enlarged, from the design of Mr. J. J. Cole.

A new vestry-hall for Springfield, near Chelmsford, is now in course of erection by Mr. Bloomfield. Mr. Pertwee, of Chelmsford, is the architect.

New schools have been erected in connection with Holy Trinity Church, Blackburn. They are built in the Early English style, from designs by Mr. James Birtwistle, architect, Blackburn. The schools are substantially built, great care having been taken with the warming and ventilation.

Mr. John Ruskin, as Slade Professor of Fine Arts at Oxford, will deliver next term a course of lectures "On the Relation of Natural Science to Art."

A subscription has been opened in the Ecole des Beaux Arts, Paris, for the erection of a monument to Henry Regnault, slain in the defence of Paris.

Mr. H. Heaps has been appointed senior messenger to the City of London Court of Sewers, at a salary of £120 a year.

The *Illustrated Australian News* states that a photographer of Clunes, named John Tanner, has, after four years of labour, succeeded in producing photographs enamelled upon copper. These are said to be, as works of art, really beautiful, and almost indestructible.

The freehold premises No. 137 and 138, Aldersgate-street were sold last week by Mr. Horwood, at the Mart, for £2,800. On the same day, the freehold premises No. 1 and 1a, Little Love-lane, Wood-street, let on lease at £150 per annum, were sold for £6,900.

It is said that there are now 1,500 empty houses at Tottenham, principally owing to the lack of a proper system of drainage.

In the accounts of the Churchwardens of "S. Andrew Huberd beside Eschepe London," for the years 30th April 1474 to the 30th April 1476, occurs this entry:—"Paid for making of a new bench in a pew in the churche, 4d."

It is proposed to erect a new church for the parish of Magherally, near Banbridge, of an ornamental character, from the designs of Mr. Thomas Drew.

Additions are to be made to the parish church of Scapatriek, Banbridge. Mr. Thomas Drew, R.H.A., architect, has been entrusted with the work.

Selkirk church was reopened for public worship on Sunday, after a series of extensive alterations, including the raising by several feet and arching of the ceiling, and the introduction of a small end gallery capable of containing 130 persons—the whole being estimated to cost upwards of £350.

A telegram from Constantinople says that M. de Lesseps is attempting a combination for the purpose of negotiating the purchase of the Suez Canal by foreign Powers. His overtures are said to have been unfavourably received by the Porte and by the Khédive.

On Friday last the parish church of Boughton Bleau, Kent, was reopened, having been during the last six months undergoing restoration, at a cost of something like £1,600. The architect is Mr. St. Aubyn, of London, and the contractor Mr. L. Shrubsole, of Faversham.

MEETINGS FOR THE ENSUING WEEK.

FRIDAY.—**ARCHITECTURAL ASSOCIATION.**—"On Hammer-beam Failures, Eltham Palace." By Mr. W. White, F.S.A., F.R.I.B.A. 7.30.

Trade News.

TENDERS.

BASFORD.—For the erection of two houses in Alma-street, Basford, for Mr. Bryan. Mr. John Collyer, architect, Nottingham.—Curtis (accepted)..... £469

BEDFORDSHIRE.—For the erection of Clapham Parochial Schools, Bedfordshire, for Mr. John Day, architect. Quantities supplied:—

Dover, Dowell, & Co.	£1616
Poster	1593
Young	1435
Maxey	1389
Moore	1378
Spencer	1335
Corby & Son	1333
Carter (accepted)	1316
Saul	1299

BOURNEMOUTH.—For the erection of a shop and premises at Madeira Vale, Bournemouth. Messrs. Tuck & Burton, architects:—

Dunford	£1172
Nightingale	1117
Stevens	1092
Stroud	1073
Hoare & Co.	1059
Walton	1045
Brett Brothers	999
Baker	995
Seovell & Squier	948

CHELMSFORD.—For new Vestry-Hall, Springfield, Chelmsford. Mr. C. Pertwee, architect:—

Thorn	£267 0 0
Barnard	256 13 0
Bloomfield (accepted)	236 4 10

DEVONSHIRE.—For the restoration and new seating of Germans-Week Church, Devon. Mr. S. Hooper, architect:—

Bullen & Bevan	£630
Blatchford & Son	574
Hill & Squire	574
Bone & Son	569
Chapman & Ward	(accepted) 547
White & Sons	547

FENCHURCH-STREET.—For alterations to 80, Fenchurch-street, for Messrs. Cassell, Smith, & Co. Mr. E. H. Horne, architect:—

Sparks	£2756
Temple & Forster	2150
Brass	2076
Hill, Keddell, & Waldram	2050
Wicks, Bangs, & Co.	1990
Eaton & Chapman	1986
Scrivener & White	1963
Williams & Son	1847
Sewell & Son	1844
Foster (accepted)	1777

HUNTINGDON.—For new sewer and other works at Ramsey, Huntingdon. Mr. Robert Hutchinson, County Surveyor:—

Hubbard	£1924 0 0
Herman	1783 10 0
Potter	1664 10 0
Pizzey	1500 0 0
Coker	1461 14 0
Dover & Co.	1460 0 0
Walker	1435 0 0
Thompson	1375 0 0
Strickson	1354 6 10
Daukley	1350 0 0
Phillips	1301 13 5
Lord	1300 0 0
Freeman	1299 5 11
Balmer	1289 0 0
Acock	1200 0 0
Harvey & Pussan	1197 10 0

MARGATE.—For proposed additions to the White Hart Hotel, for Mr. William A. Fagg. Mr. Joseph S. Moye, architect:—

Gasken & Godden	£2631
Cooke & Green	2528
Wilson	2455
Spencer & Hayward	2385
Bushell & Son	2320
Adcock & Rees	2079

NOTTINGHAM.—For the erection of factory, engine-house, &c., in Dame Agnes-street, Nottingham, for Messrs. Rogers & Co. Mr. John Collyer, architect:—

Slim	£3231 0 0
Dennett & Co.	3206 6 0
Vickers	3194 0 0
Curtis	3190 0 0
Bell & Son	3176 0 0
Tutin	3157 10 0
Stevenson & Weston	3142 0 0
Lynam (accepted)	3094 0 0

NOTTINGHAM.—For the erection of Auction Mart, Bridle-smith-gate, Nottingham, for Mr. J. Grundy. Mr. John Collyer, architect:—

Vickers	£1010 0 0
Blundell & Short	994 0 0
Jelley	940 0 0
Attenborough	930 15 0
Shepperson	860 0 0
Lynam	820 0 0
Hind (accepted)	810 0 0

NOTTINGHAM.—For rebuilding warehouse in Woolpack-lane, Nottingham, for Mr. J. A. Howitt. Mr. John Collyer, architect:—

Underwood	£402 0 0
Vickers	399 0 0
Lynam	395 10 0
Fish	395 0 0
Slim (accepted)	390 0 0

NOTTINGHAM.—For the erection of a house in Woodbro'-road, Nottingham, for Mr. G. Sims. Mr. John Collyer, architect:—

Bickley (accepted)	£540
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NOTTINGHAM.—For the erection of offices, &c., at S. Peter's-gate, Nottingham, for Mr. R. H. Speed. Mr. John Collyer, architect:—

Vickers	£840
Johnson	835
Curtis	810
Jelley (accepted)	800

SOUTH KENSINGTON.—For the erection of the Belgian Court at the annual International Exhibition, South Kensington, for la Société Belge pour l'Encouragement de l'Art et de l'Industrie aux Expositions Internationales de Londres et Brussels. Estimate for revised plans and specification:—

Aries	£2400
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CONTRACTS OPEN FOR BUILDING ESTIMATES.

WHITEHAVEN, December 30.—For the construction of a wet-dock and a short railway connected therewith.—John Collins, Secretary, Town Hall, Whitehaven.

WOOLWICH, December 30.—For the erection of schools in the district of S. John's.—Architect, Mr. J. W. Walter, 5, South Molton-street, W.

YORKSHIRE, December 30.—100 lineal rods of dry walling, 6ft. in height, on the Egton Estate, North Riding.—George B. Smith, Land Agent, Bradford.

SALFORD, January 11.—For the sewerage, paving, and completing of certain streets in the Salford district.—Edwin Andrew, Town Clerk, Town Hall, Salford.

BRADFORD, January 1.—For altering and converting the Old Mechanics' Institute, Leeds-road, into business premises and warehousing.—Lockwood & Mawson, Exchange, Bradford.

BRADFORD, January 1.—For the erection of mill, warehouse, and sheds at Legram's-lane.—Lockwood & Mawson, Architects, Exchange, Bradford, 10, Lincoln's-inn-fields, London.

NORTH-EASTERN RAILWAY, January 12.—For constructing and fixing a pair of 60ft. dock-gates, required for the Tyne Dock, South Shields.—C. N. Wilkinson, Secretary, York.

NORTH EASTERN RAILWAY, December 29.—For the supply of 3,000 tons of cast iron chairs, to be delivered during the year 1872.—C. N. Wilkinson, Secretary, York.

ILKLEY, January 4.—For the erection of two semi-detached villa residences at Ilkley.—Bell & Thornton, Architects, 31, Victoria Chambers, South Parade, Leeds.

LEEDS, January 3.—For the erection of schools, S. Peter's, Hunslet Moor.—Alfred Bently, Architect, 2, Bond-place, Leeds.

SHERBORNE, December 30.—For the erection of new school-room and class-rooms.—Alexander Lander, Esq., Architect, Barnstaple.

BRADFORD, December 27.—For the erection of nineteen cottages at Silsden.—Mr. Samuel Jackson, Architect, 2, Kirkgate, Bradford.

BLACKPOOL, January 1.—For the erection of gas-works, at the Lakes Hall Park, capable of making from 10,000 to 18,000 feet of gas per day.—Mr. Rnshon, Secretary, Blackpool.

ONGAR, January 1, 1872.—For the erection of a new infirmary, hospital, schools, &c., at the Union House, Stamford Rivers, Essex. Charles Mott, Clerk, Chipping Ongar.

COLNE, January 3.—For the erection of a police station at Colne. Mr. Waddington, 5, Grimshawe-street, Burley.

STOCKPORT, December 26.—For (1), the construction of a covered conduit, 1,400 yards in length, in Lynn Park, 1½ miles from Disley, with masonry and other work; also (2), for completing a reservoir, commenced during the last summer, in Lynn Park. Mr. G. Mather, Secretary, Millgate, Stockport.

YORK, January 25, 1872.—For the construction of the approach railway, to the proposed new station at York, making sundry new roads, and the building of new coal depôts, with the approaches, &c. The Secretary, North-Eastern Railway Company, York.

WEST HARTLEPOOL, January 25, 1872.—For the construction of a new dock at West Hartlepool, with the necessary entrances, and also for the construction of a double line of railway, 1 mile 52 chains in length. The Secretary, North-Eastern Railway Company, York.

HUDDESFIELD INFIRMARY, December 28.—For additions and alterations to the infirmary. John Kirk & Sons, Architects, Huddersfield and Dewsbury.

BILLERICAY, December 26.—For paving the foot-paths on either side of the town of Billericay with 2½in. tooled York paving.—Charles C. Lewis, Clerk to the Billericay Highway Board, Brentwood.

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LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

	LEAD.	
Pig—Foreign	per ton	£18 15 0
" English W.B.	do	0 0 0
" Lead Co.	do	18 15 0
" Other brands	do	18 10 0
Sheet Milled	do	19 0 0
Shot, Patent	do	20 15 0
Red or minium	do	21 0 0
Litharge, W.B.	do	0 0 0
White Dry	do	26 0 0
" ground in oil	do	0 0 0

	COPPER.	
British—Cake & Ingot	per ton	£89 0 0
Best Selected	do	91 0 0
Sheet	do	91 0 0
Bottoms	do	95 0 0
Australian	do	89 0 0
Spanish Cake	do	89 0 0
Chili Bars, cash	do	84 0 0
" Refined ingot	do	91 0 0
Yellow Metal	per lb.	0 0 7½

	IRON.	
Pig in Scotland, cash	per ton	£3 10 3
Welsh Bar, in London	do	8 15 0
" Wales	do	8 0 0
Staffordshire	do	9 15 0
Rail, in Wales	do	7 10 0
Sheets, single in London	do	11 15 0
Hoops, first quality	do	10 15 0
Nail Rod	do	9 12 6
Swedish	do	11 5 0

	OILS, &c.	
Seal, pale	per tun	36 10 0
Sperm body	do	90 0 0
Cod	do	35 10 0
Whale, South Sea, pale	do	36 0 0
Olive, Gallipoli	do	54 0 0
Cocount, Cochin, tun	do	44 0 0
Palm, fine	do	39 10 0
Linseed	do	23 10 0
Rapeseed, Eng. pale	do	46 0 0
Cottonseed	do	23 0 0

	TIMBER.	
Teak	load	12 10 0
Quebec, red pine	do	3 15 0
" yellow pine	do	4 5 0
Quebec oak, white	do	6 0 0
" birch	do	3 15 0
" elm	do	3 15 0
Dantzic oak	do	4 10 0
" fir	do	2 7 0
Memel fir	do	3 5 0
Riga	do	3 0 0
Swedish	do	2 0 0
Masts, Quebec red pine	do	4 0 0
" yellow pine	do	4 0 0
Oregon	do	7 0 0
Lathwood, Dantzic, fm.	do	4 10 0
St. Petersburg	do	8 0 0

Deals, per C, 12ft. by 3 by 9in.		
Quebec, white spruce	12 10 0	18 0 0
St. John, white spruce	12 0 0	14 0 0
Yellow pine, pr reduced C		
Canada, 1st quality	18 10 0	21 0 0
" 2nd do	13 0 0	14 10 0
Archangel, yellow	12 10 0	14 10 0
St. Petersburg, yellow	12 10 0	13 10 0
Finland	6 15 0	7 15 0
Memel and Dantzic	0 0 0	0 0 0
Gothenburg, yellow	8 10 0	10 10 0
" white	8 0 0	9 0 0
Gefle, yellow	10 10 0	12 10 0
Soderham	8 10 0	12 0 0
Christiana, per C, 12ft. by 3 by 9in.	10 0 0	12 10 0
Other Norway	7 0 0	8 0 0
Flooring boards, pr square of lin, first yellow	0 10 0	0 11 6
First white	0 6 6	0 9 6
Second qualities	0 6 0	0 8 6

BANKRUPTS.

TO SURRENDER IN THE COUNTRY.

Francis Chappel, Ossett, stonemason and builder, January 4, at Dewsbury.—William Lloyd Deady & William Deady, Southport and Wigan, builders, January 3, at Wigan.—Robert Metcalfe & William Ward, Salford, builders, January 3, at Salford.—David Rowland, Stockport, builder, December 29, at Stockport.

SITTINGS FOR PUBLIC EXAMINATION.

January 24, S. Hatch, Asylum-road, Old Kent-road, builder.

DIVIDEND MEETING.

January 16, J. Howick, Hove, builder.

DECLARATIONS OF DIVIDENDS.

L. Lloyd, Beckbury, Salop (formerly of Liverpool), timber merchant, div. 3rd.—C. E. Bennett & T. E. Hignett, Liverpool, timber merchants, div. 4th.

BANKRUPTCIES ANNULLED.

John Edward Dyne, Birkbeck-road, Hornsey, builder, December 16.—George Short, Warrington, builder, December 14.

PARTNERSHIPS DISSOLVED.

Priestly & Smith, Halifax, machine makers and engineers.—Pearson & Anckland, Dewsbury, masons (as far as regards J. Anckland).—Duke, Evans, & Co., Plymouth and elsewhere, lime burners and merchants.—G. & J. Hope, Wakefield or elsewhere, bricklayers.—Guy & Catterall, Baglit, cement manufacturers.

BREAKFAST.—EPPS'S COCOA.—GRATEFUL AND COMFORTING.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills."—"Civil Service Gazette." Made simply with Boiling Water or Milk. Each packet is labelled—"JAMES EPPS & CO., Homoeopathic Chemists, London." Also, makers of Epps's Milky Cocoa (Cocoa and Condensed Milk).

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ENGLISH MECHANIC
AND WORLD OF SCIENCE.

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PRICE TWOPENCE WEEKLY.

CONTENTS OF No. 352, DECEMBER 22.

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An Artificial Volcano.
Testing the Purity of Oils.
New Forms of Galvanic Battery.
Science in Plain English.
The Adulteration of Food.
Note on a Spiral Leyden Jar.
Planing Cast-Iron.
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Touch-Lightener for Organs.
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Act for the Prevention of Crime in Dealing in Old Metals.
Geometric Lathe-Rest and Universal Cutter.
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"Sigma's" Policy and Chemical Notes.
Colliery Explosions.
The Knight's Move.
Judging Distances.
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WILLIAM J. VIAN, Secretary.

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THE BUILDING NEWS.

LONDON, FRIDAY, DEC. 29, 1871.

CAMBERWELL VESTRY-HALL COMPETITION.

THE district of short weights and false measures keeps up its well-earned reputation. Its public business is conducted on the same honourable principles as its private trade. Four months ago the Camberwell Vestry announced that they were desirous of receiving designs for a new vestry-hall, and laid down the conditions which competitors were to observe. A number of architects whose misfortune it was to be unacquainted with the neighbourhood have just begun to see how things are managed in the parish of S. Giles's. They prepared drawings at a cost, in time and money, which we should estimate at from £20 to £50 in each instance, with no better security than a reliance on the honour and good faith of the body which had asked for them. Their imprudence has met with its reward. The Vestry, without compulsion from anybody, framed, as we have said, in August last, a set of rules for competitors to obey. One rule was that the drawings were to be "limited to plans, sections, and elevations;" another was that the entire cost of the buildings, including "offices, fittings, warming, ventilation, lighting, drainage, enclosure walls, railings, and all incidental works and charges, including architect's commission and clerk of works' salary," was not to exceed £8,000. These rules many of the competitors were foolish enough to respect. They seem to have had the impression that the Vestry having laid down the laws for the contest would enforce them; that they would see fair play, and deal out the same measure, even if it happened to be rather short measure, to friends and strangers alike. They seem, in fact, to have had very romantic notions, and to have quite misunderstood the people they were dealing with. Some few, however, of those who submitted plans were much more wide-awake. Perhaps they knew the neighbourhood better; perhaps, according to the north-country phrase, they were "Yorkshire too." They were well aware what an immense advantage it would give them *not* to be "limited to plans, sections, and elevations"—no very remarkable knowledge, for every architect is perfectly familiar with the fact. Their special acuteness lay in this, that they foresaw the Vestry would not adhere to their own conditions. They guessed, what has turned out to be the fact, that the rules were worth nothing except to mislead strangers, so they boldly set them aside, and are rewarded by having their designs chosen and exhibited. That a design shown only by plans, elevations, and sections stands no chance in a competition against one illustrated by showy perspectives is a fact of the fullest notoriety. When, above all, a non-professional committee are the judges, it is ridiculous to put the two in comparison, and a grosser piece of unfairness cannot be conceived than to let the latter enter the lists along with the former. Fancy the members of the Camberwell Vestry carrying out their principles in contests of another kind. If they happened to preside over a boat-race, their favourite crew would be quite safe in fitting up their boat with a small steam-engine and strew propeller; true, they limited the crews to eight oars, but they could not take exception to a trifling addition of this sort. If it was a foot-race, there would be no objection to the Camberwell Champion taking his part, if more convenient to him, on horseback; and at a boxing match the Peekham Pet would have the option of wielding a sledge-hammer or a couple of two-pound weights (not filed) as in the exercise of his discretion he might see fit. So much for one of the

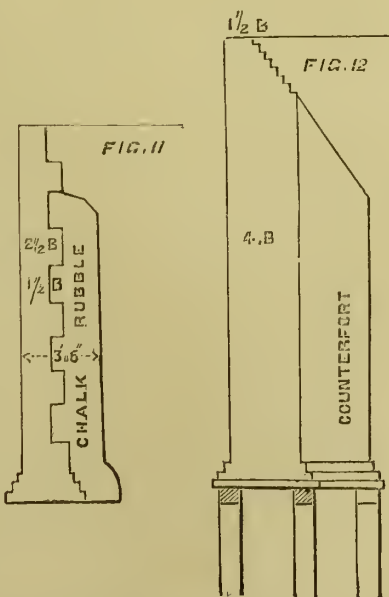
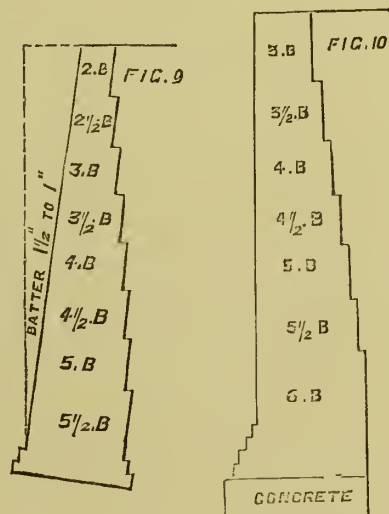
Vestry's conditions; of the others we may have more to say. In such cases as this, indeed, it is usually of little use to say anything. A vestry, according to Sydney Smith's remark, has neither a soul to be saved nor a body to be kicked. It is not, however, totally invulnerable. It has a pocket, and often a highly-sensitive one; and it is to this that arguments should be addressed. To ask for fair play and honourable treatment is a waste of time; an action for obtaining goods under false pretences, or a claim for damages through non-performance of contract, are probably the mildest forms of remonstrance likely to be of any avail.

NOTES ON BRICKWORK.—VII.

THE section of a retaining wall shown in Fig. 8 (given in our last) is a very good one for average practice. Its back is, in the main, plumb; its face batters at the rate of 2in. in a foot, and it finishes at the top with a thickness of 18in. When the backing is very particularly attended to, the dimensions may be slightly reduced, but, on the other hand, when but little special care is taken in this matter, the dimensions shown in the figure would be hardly sufficient.

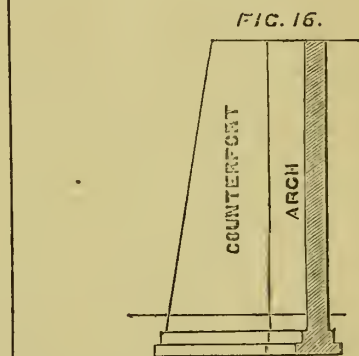
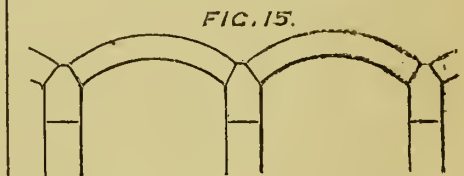
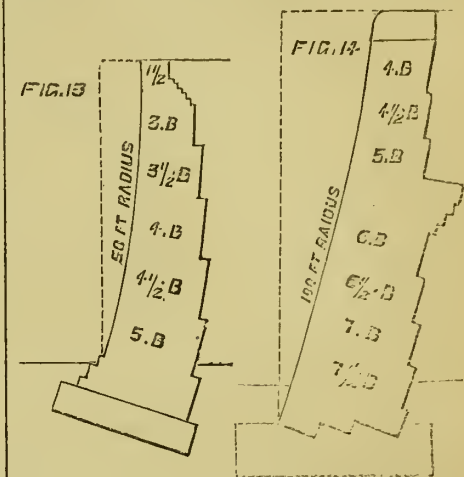
As a matter of practice we subjoin some examples of executed retaining walls in brickwork.

Fig. 9 shows the section of the wing walls of a bridge carrying a road over a railway.



It has a plumb back, and batters at the rate of 1 1/2in. in a foot. Fig. 10 is the section of the wing walls of a railway bridge over a canal. It is built plumb both back and face, and its thickness is therefore greater than in the

examples which have battering faces. Fig. 11 is the section of the wing walls of an occupation bridge, which have but a thin facing of brickwork backed up with chalk rubble, the two being bonded together by sets-off. Fig. 12 is the section of the wing walls of another railway bridge over a canal. It is built plumb, and only four bricks thick, but it has counterforts 3ft. wide, and 3ft. thick, placed 7ft. 6in. apart in the clear. The specification of the brickwork of this bridge says, "The bricks are to be sound, hard, and well-burnt common stocks. The mortar is to be of fresh burnt Warrsworth blue lime, mixed with clean sharp drift sand in the proportion of three and a half of sand to one of lime for the back or inside mortar and the



grouting, and two and a half of sand to one of lime for the front mortar. The lime and sand are to be thoroughly mixed by being passed through a screen in their dry state, and afterwards well tempered and brought to a proper consistency by being passed through a pug mill. The lime is to be brought fresh from the kiln as wanted and kept dry under cover. The work to be laid with a joint not more than 1/4in. in thickness, to be laid headers and stretchers alternately, and, to assist the bonding of them well together, every sixth course is to be laid diagonally. The front and back courses are to be flushed up solid with mortar, and the body of the work soundly grouted every course, and the filling-in bricks are to be rubbed in so as to make each joint flush and sufficiently filled with mortar. The front joints to be neatly drawn. The external faces of the work above the level of the ground to be faced with the hardest and best of the bricks. The brickwork is to be protected from injury from frost by covering the walls with straw and earth, and on recommencing the work the joints damaged are to be made good

again." Fig. 13 is the section of a retaining wall with a curved batter. The radius is 50ft., and the centre of the circle of which it forms a segment is in the same horizontal line as the top of the wall. Fig. 14 is the section of a river wall. It differs from the last example, inasmuch as its face is the segment of a circle of 100ft. radius, the centre of which is situated at about half the height of the wall above its top, and in having a greater thickness at the top, a peculiarity of river walls, wharf walls, and dock walls, the reason for which is to be found in the requirement of a wide coping in such situations; for the merchandise is often of a heavy character, requires great solidity and breadth in the coping, and cranes and warping posts are usually placed at no great distance behind the walls, and all these things require a more than ordinary thickness of wall at the top, and moreover the ground at the back of the wall cannot be made dry by draining, which is another reason for extra thickness. Many such walls, especially dock walls, are much thicker than the example given in Fig. 14.

When about double the width of space can be had that is required for a wall in one body a considerable saving of materials may be effected by a system of arches and counterforts when the height is not excessive. Fig. 15 is a plan and Fig. 16 a section of such a wall. It saves at least one brick in the thickness of the wall.

ERRATA.—In last week's "Notes," in line 15 from top, in column 1, p. 469, the letter *l* is omitted. In the last equation in that column and in the first on the next column, the radical sign, $\sqrt{}$, is intended to refer to the whole. In the 4th equation in the same column, for

$$\left(1 - \frac{1}{3} \text{ of } \frac{8-4}{8-4}\right), \text{ read } \left(1 - \frac{1}{3} \text{ of } \frac{8-4}{8+4}\right)$$

THEORY OF THE ARTS.

PLASTIC SUBSTANCES AND ARTIFICIAL COMPOUNDS—THEIR DECORATIVE VALUE.

(Continued from page 450.)

RESUMING my remarks on calcareous incrustations, such as stuccoes, in reference to ceilings and walls, it may be observed that moulded, cast, and impressed patterns seem to be the rational modes of ornamentation, or rather, means of applying it. In some cases the impressed decoration might be made in the finishing coat of the work, the impressions being slight, and only sufficient to give relief to a flat surface without breaking it into compartments. Stencilled patterns or flat geometrical renderings in flat tints of colour may be applied to both walls and ceilings with good effect, but they become an expensive means of decoration in ordinary dwelling-houses, by reason of the frequent cleanings required in houses where gas is burned. Plain plastering can be coloured in distemper, and is easily cleaned and re-coloured in monochrome tints. Some of our Elizabethan examples of plastered ceilings, in which the surface is relieved by panellings and ramifications of straight and curved lines or mouldings in geometrical forms, display much taste, and might be advantageously studied. There is a manifest want of taste in highly curvilinear lines and natural forms in any surface bounded by right lines.

Coloured stuccoes or compositions, in which the colouring matter consists of coloured powders of sand or glass, and other colouring substances, may frequently be adapted with success internally in lieu of white surfaces, which are best produced by the use of flint powder for the smooth finishing coat. Some metallic colouring ingredients, however, are affected injuriously by the lime; but coloured calces of iron, glistening scaly mica, coloured fluor, and especially coloured glass or stones pulverised, are, when

moderately used, adapted for coloured incrustations. The smooth external coat of plastering should in all cases be laid on a coarse hard rendering. Plastering material which contains fine bone ashes of the whitest burnt bones improves the stucco by preventing the damps, or "sweating," as the plasterers term it, the bone ash serving by its texture to aid in the exhalation of moisture.

It may not be out of place here to mention the "selenitic mortar" recently introduced by Colonel Scott. Its composition contains nothing new; it chiefly consists of freshly-burnt lime and sand, with the addition of sulphate of lime or plaster of Paris, and this last ingredient is supposed to give it its hardness.

The great object to be attained in calcareous or these plastic substances is tenacity with plasticity. Bullocks' blood, oil, milk, clay, and other fatty and resinous substances are probably destined to improve our stuccoes and cements in the first respect; and the Greeks and Romans gave the term "mastic" or "maltha" to compositions in which milk, lime, and sand were used; hogs' lard and figs also are mentioned as ingredients.

Scagliola work is a separate trade. The composition is formed of pure calcined gypsum, mixed with glue, isinglass, and alum, and other substances, the colouring matter being introduced while it is laid or floated; the surface is afterwards prepared for polishing.

The admixtures or various patented plasters known as Parian, Keene's, Martin's, &c., have, as I said before, sulphate of lime or gypsum as their basis instead of carbonate of lime. This sulphate only parts with its water of solidification under the action of burning without decomposition, and it is the re-admixture of the water which produces the solidification required in the application of this material. By the addition of some of the salts of alumina, borax, potash, &c., great hardness and beauty is obtained, while by the colour imparted by earthy and metallic oxides, such material may assume a quality and appearance approaching marble. It is unnecessary here to refer to the numerous patents for compositions of this sort of plaster, having all the common ingredients mentioned. There is another class of substances having other bases, as papier maché, carton-pierre, &c., in which whitening, the pulp of paper, resin, and glue, form the chief ingredients. Their use for architectural decoration has been known for quite half a century in France, though only lately in this country. The lightness, plasticity, tenacity, hardness, and facility of application, recommend the material to architects as one subservient or contributory to other materials. For cheap stamped or cast ornamentation, such as the capitals of columns, cornices, ornamental ceilings, and enrichments of various kinds, carton pierre or papier mache supply a very useful material, and one, I think, hardly sufficiently recognised.

Physically, calcareous and tenacious substances, as have been described, appear to hold a place between the granular, brittle qualities of stone and the toughness and elasticity of wood, while they are less exposed to the disintegration and decay to which these materials are subject; hence their applicability to a large number of purposes, useful and decorative, in architectural works where stone or wood would be unfit or expensive. As the decorative treatment of such materials, moreover, can be effected by simple processes such as running, moulding, or impressing, the labour and cost compared with that of carving or stone cutting is greatly in its favour.

Passing to artificial stone with a silica base, Messrs. Ransome's compound may be noticed. It is composed of sand, grains of pebbles, some limestone, clay, or marble, cemented together by dissolving flint in caustic alkali at a high temperature. The alkali combines with the silica and forms a

glass cement, which unites the materials and forms a non-absorbent compound of great hardness. This material is moulded into the required form when in a soft state, and is then subjected to burning in a kiln after air drying. One disadvantage of this stone is the effervescence of salts of soda, which affect the surface after a short time; but if this could be remedied, there is no doubt it will become a valuable compound and one capable of resisting atmospheric agencies. Improvements in the manufacture have made this material assume admirable imitations of granites and marbles, as well as a useful substitute for stone in hydraulic works. For decorative purposes the capabilities of such a material so readily moulded are unquestionably great; but the treatment it has received in a decorative sense is in some cases quite at variance with the material and its process of manufacture. As I have elsewhere said, such plastic and easily-moulded substances too often become vehicles of bad taste.

Brick and terra-cotta demand a passing remark in speaking of plastic substances. Manufactured of a material universally attainable, all ages and nations have recognised them. As a material for standing weather, bricks or burnt clay articles are somewhat deficient in the essential of non-absorption of moisture. The admixture of several clays and other materials and different methods of burning have been tried to attain this important desideratum, without which bricks in this damp climate can never be used solidly in wall building unless extremely hard or vitrified. The manufacture of moulded bricks is a branch which has lately been usefully developed; but the improved kind of burnt brick earth, known as terra-cotta, is far preferable on account of its superior hardness for mouldings and exposed ornamental or useful accessories. The clay being mixed with crushed pottery or calcined flints and subjected to great heat, a stoneware without fusion of the ingredients is produced. The value of terra-cotta as a decorative material is great; but I think its employment artistically has been overdone, as in the case of other substances readily cast or moulded. Thus, in the use of this material in the Albert Hall at Kensington, it has been pressed into patterns not connected with a proper use of the material, to say nothing of the employment of enrichments in exposed plinth courses and other outside mouldings. Such clay and silica compounds as brick and terra-cotta are admissible in all exterior work, whether useful or ornamental; but they should never assume the treatment which properly belongs only to carving or hand-wrought ornamentation in other materials, either expensive in themselves or occupying positions in which higher or more elaborate decoration is appropriate.

Summing up these remarks, we have—

1st. Cement, the adhesive substance, omitting other materials, the quality of which depends on the purity of its ingredients—sand and lime,—and whose hardness is attained by its re-absorption of the carbonic acid of the atmosphere, the lime returning to its original condition of a carbonate.

2nd. Stuccoes or plasters for covering walls and ceilings. As a non-absorbent, incombustible material, its use is of value, though such artificial compositions are objected to as disguises of the materials covered. As non-resonant and non-conductive casings they may be usefully employed. The decorative treatment of plastering should be of a superficial character, and simple moulding or impressing should be the mode of treatment.

3rd. Plastic compounds, such as calcareous or tenacious sorts, may be used for decorative purposes, in which lightness of material and economy are important; and that running, moulding, or casting are the only appropriate modes of treating such substances.

G. H. G.

ART TEACHINGS OF THE INTERNATIONAL EXHIBITION.—VI.

BY OMICRON.

Conclusion.

ARCHITECTURAL DESIGNS — LACE — EMBROIDERY — MISCELLANEOUS ART — REPRODUCTIONS.

WE must now hasten to make an end with these Official Reports on the late International Exhibition, to which we have already devoted more of our space than their intrinsic merit would have warranted. These productions are, in truth, only entitled to attention as forming a rather conspicuous feature in the operations of the Royal Commissioners, who, through the ministrations of Mr. H. Cole, C.B., and Major-General Scott, have assumed to themselves the functions of public instructors in all that relates to industrial and ornamental art. We believe that these pamphlets have had very little sale, and have been very little read—circumstances which, in the case of bad works generally, might be held to disentitle them to any extended public criticism. The extent to which we have gone in examining their details, in exposing their mis-statements of facts, and correcting their errors of opinion, has been, therefore, chiefly done in an historic sense, and with a view of preserving to posterity some record of a literary curiosity which, as we apprehend, will soon settle down into comparative oblivion.

Mr. T. Roger Smith, in reporting on the Architectural Designs in the International Exhibition, does his best with small and poor materials. Like too many of his colleagues, he has to complain of the almost total absence of exhibits from abroad, inasmuch that "the collection is virtually an English Exhibition." This result by no means surprises us, the true and sole object of all foreign exhibitors being gain, and there being nothing to be got by exhibiting in this country designs of buildings erected, or projected for erection, abroad. There may, also, with many foreign artists, have been a less generous motive for abstaining from giving to their inventions, in construction and detail, additional publicity for the edification of their English rivals. From similar considerations, perhaps, it has also occurred that the designs exhibited by English architects are in few cases those of works in actual progress, the exhibition being, in fact, "to a considerable extent retrospective," and including a large proportion of unexecuted designs, both for public and private buildings. Mr. Smith prefaces his very careful examination of the designs exhibited with some historical remarks on the features which have marked the progress of architecture in this country, and which have been chiefly characterised by successive copyism of bygone models, a practice which exists to our day. Well may the reporter, in the contemplation of such a state of things, exclaim, "All this is not living art;" adding, "a strong desire has been naturally felt for something which should have more life and growth about it than belongs to the archaeological resurrection of one style after another." Of the architecture of the present day he speaks as of a chaotic waste, and all the consolation he appears to have derived from a consideration of the examples exhibited is comprised in the reflection that they may "afford indications of a possible future for English nineteenth century architecture." This is saying little in the way of encouragement for an age which having already perpetrated a signal and gigantic blunder in its Houses of Legislature, is about to commit a similar mistake by plunging into the expense and responsibility of building a whole city of Law Courts, every line of which will be an "archæological resurrection," and the combined effect of which can, we fear, only operate as a "caution" to the public mind of the "possible future" to which Mr. Smith looks forward.

Passing over Mr. J. H. Pollen's substantial report on "Tapestry," &c., which is satisfactory in its way, we come to Lace and Embroidery, which are respectively treated of by Mrs. H. Reeves and Canon Rock. And, here again we must remark, as we had occasion to do in the case of copperplate and wood engraving, that the editor has placed the two subjects in the reverse order to that to which they would be entitled, according to their dates of invention. It is true that Canon Rock, in the course of his brief paper, speaks of lace as the "twin sister" of embroidery, embroidery being an extremely ancient art, mention of which is frequently made by Homer; whereas lace is an invention of modern times. Beckmann tells us that he knows of no passage in Greek or Latin authors which alludes to it, and that the *opus Phrygianum*, in use amongst the Romans, and which some writers have treated as a sort of lace, "as far as I have hitherto been able to learn, consisted only in needlework." The knitting of lace was first known about the middle of the sixteenth century, and various countries and states, Germany, France, Venice, Genoa, Mechlin, Brussels, &c., lay claim to it. The probability is that it was introduced into France by Marie de Medicis. But however imperfectly informed in point of history, there can be no question as to the enthusiastic admiration, not to say devotion, with which the right reverend reporter treats the productions of his favourite art. Take, for instance, the Epicurean fervour with which he speaks of a brown silk cushion, trailed all over with nicely-wrought embroidery, which "is everywhere very low, and thus admirably fits the cushion for use on any occasion." As instances of the favoured destiny that may await this fortunate cushion—"If taken to church for the ecclesiastical dignitary to kneel upon at parts of the celebration, he would not feel a moment's pain from any rough broad welts of golden embroidery beneath him; whilst in stately observances the high-born dame might rest her bare arms and hands upon it without danger of being scratched or scarred." The "sensational" transition from the well-swathed shins of the "ecclesiastical dignitary" to the bare arms of the "high-born dame" is of the very poetry of dilettantism. Mrs. H. Reeves is to be complimented upon the graceful interest with which she invests her subject, not losing sight of the important claims of lace as an accessory or ornament in pictorial effect, more particularly in portraiture.

As an illustration of the shifts to which the management has been put to find subjects for its numerous staff of reporters, we may mention the case of Mr. R. Redgrave, who, on sitting down to write his report "On the Present State of Design as seen in Manufactures," commences in an apologetic vein by informing us that he has already, on the occasions of the Exhibitions of 1851, 1862, and 1867, reported on the same subject, and that being now requested to repeat his report for the fourth time, it may well be expected of him that he will but "repeat the matters contained in his previous reports." This being the case, this particular report, as an emanation of the International Exhibition of 1871, calls for little remark, save that besides repeating what has already been said by the writer in former reports, it travels over the same ground which has been thoroughly explored by others of the '71 reporters. A similar embarrassment also overcomes Mr. W. B. Scott, who, being called upon to report upon "Miscellaneous Art," after taking a glance at the fifteen other reports upon art subjects, fine art, and applied art, which compose the scheme of operations in which he has to take part, states very candidly, "I find some uncertainty as to the extent and limit of the field to be included. It may be that some portion left to this section by other reporters shall be left by me in a similar manner to them, while certain objects

suggestive of remark will be found included by both." In his conscientious exertions to do his duty, in short, to find something to write about, he falls upon the oft-disputed subject of the revivals of old or disused processes, which seem especially to mark the art genius of the day, and upon which he inflicts the remark that "In some cases processes or methods, antiquated by more perfect science or mechanics, have been revived in a somewhat blind way," a clumsy sentence which, we confess, we do not pretend to understand. Perhaps what follows may throw a light upon the mystery. "It is true," Mr. W. B. Scott goes on to say, "that we must do many new things before the one new thing that is to remain useful and influential can be eliminated." What is this?—the thing which is "to remain" is also "to be eliminated;" the conditions are impossible. In another remarkable passage, Mr. W. B. Scott announces that "objects in various metals, as well as the application of brass, &c., to furniture and other things, are numerous and interesting." Mr. W. B. Scott was out of place in Division I.; he ought to have been "eliminated" from it, and transferred to Division II., Class 10, Subsection b, where amongst other "educational works and appliances," he might have formed advantageously an acquaintance with Murray's Grammar and Johnson's Dictionary.

This series of reports appropriately concludes with one on "Reproductions" by Lieut. H. H. Cole—"reproduction" or copying being at the very base of all the system of teaching at South Kensington. It is, besides, the peculiar hobby of Mr. H. Cole, C.B., whose turn of mind rules, in all matters industrial and intellectual, in that favoured district. The scope and purport of the system of art education carried on under that gentleman's auspices is not to encourage invention—not to assist and develop original talent, which should soar into distinction, but to train all up (or down) to one uniform dead level of mediocrity, in which the utmost flight of ambition is restricted to efficiently copying anything that represents the ideas of others, no matter who or what. Engrossed with this one notion, and with a sufficient amount of authority and means placed at his disposal to enable him to carry out his whim, all the rooms of the straggling South Kensington Museum teem with casts, copies of mosaics, copies of pictures, reproductions of all sorts; and to crown all, if we are rightly informed, the learned gentleman is now engaged in superintending the manufacture, by competent needlewomen, of an exact *fac-simile* of the famous Bayeux tapestry, half-scale measurement, in which all the rents and tears, and all the patchings and darnings employed for their restoration will be scrupulously reproduced. This wonderful piece of drudge-work is intended to adorn the International Exhibition of 1872; and it will certainly go far to typify the art status of the period.

Nor have the labours of Mr. H. Cole, C.B., in this channel been restricted to the production of copies of a few hundred examples of the art of other days. We are left to gather that it was through his influence that during the Paris Exhibition of 1867 a conference of European Princes took place, where the subject was discussed, and "a convention" drawn up and signed, "for promoting universally reproductions of works of art for the benefit of museums of all countries;" such reproductions to be produced "by casts, electrotypes, photographs, and other processes." This singular semi-State document is given at length in Lieut. H. H. Cole's report, and is signed by the following princes:—"Great Britain and Ireland, Albert Edward, Prince of Wales, and Alfred, Duke of Edinburgh; Prussia, Frederick-William, Crown Prince of Prussia; Hesse, Louis, Prince of Hesse; Saxony, Albert, Prince Royal of Saxony; France, Prince Napoleon (Jerome); Belgium, Philippe, Comte de Flandre; Russia, The

Cesarevitch, and Nicolas, Due de Leuchtenberg; Sweden and Norway, Oscar, Prince of Sweden and Norway; Italy, Humbert, Prince Royal of Italy, and Amadeus, Duke of Aosta; Austria, Charles-Louis, Archduke of Austria, and Rainer, Archduke of Austria; Denmark, Prince of Denmark." With all deference to these distinguished personages, we must conclude by observing that a considerable amount of discretion is desirable in the exhibition, and much more in the reproduction, of works of art as an educational means. They are, and more particularly those of the dark and Medieval ages, as often illustrative of errors and weaknesses which ought to be avoided as of beauties to admire and emulate; and in this sense they pertain more to the history than the practice of art. To fill a gallery with a heterogeneous collection of "reproductions" from all times and parts, Egyptian, Grecian, Roman, Byzantine, Medieval, Renaissance, &c., without any guide as to their classification and use as links in the history of art, would be to confuse and fatigue, without in any way instructing or elevating the spectator. Lieut. H. H. Cole, moreover, admits in his report how little attractive to a general public such an exhibition would be, as exemplified by the experience of the Crystal Palace, where "the endless attractions so well known as the leading features quite throw into the shade the instructive value of the fine art *fac-similes* which abound throughout the building, and they are rarely studied or appreciated properly."

So much for the influence of "reproductions" in the education of the popular mind. To the amateur, though a copy may be acceptable as a means of information, it can never be looked upon as at all calling up the feelings inspired by the original, the chief charm of which is often found in the local associations with which it is surrounded in its native home.

With these observations we now with alacrity take leave of these pretentious but unsatisfactory literary efforts.

FONT, RAYLEIGH CHURCH, ESSEX.

WE illustrate this week the font of Rayleigh Church, which is of Caen stone, and in two blocks, the upper one being about 3ft. 8in. by 3ft. 8in. by 2ft. 11in. The steps upon the base is placed are of blue Warwick stone, set upon a solid bed of concrete. A brass inscription-plate to the memory of Mrs. Hilliard (to whom the font is erected) occupies a position upon the centre of the lower step. The work is by Mr. Parmenter, builder, of Braintree, from the designs of Mr. Clapton C. Rolfe, architect.

NEW CHURCH AT TEDDINGTON.

WE illustrate the new church at Teddington, recently built from designs by Mr. G. E. Street, R.A. The eastern half of the church was built three or four years since, as far as is indicated on the plan. This method is an unusual one, but it seemed to Mr. Street a much better plan than building the nave and then adding aisles. The completion of the building is now about to be commenced; meanwhile the church is complete for all purposes of worship, and the temporary wall between the second and third columns effectually shuts out from the finished portion all discomfort and inconvenience.

HAYWARD'S HEXAGONAL AND SEMI-PRISMATIC PAVEMENT LIGHTS.

MESSRS. HAYWARD BROTHERS, of Cornhill and Union-street, Borough, have recently patented a new description of pavement light, which possesses a considerable advantage over any others in the amount of light it transmits to the basement. The cast-iron frame consists of a series of 3in. hexagonal recesses into which the lights are fixed. The latter are hexagonal on their upper surfaces, but have their reflecting faces at such an angle as to send the rays of light into the basement in a direct line from the front instead of allowing them to disperse equally in all directions, as is the case with every other description of pavement light. The effect viewed from the inside is brilliant without

being dazzling to the eye. These lights may be seen in the pavement round the frontage of the new Mansion House-buildings in the Poultry.

LEEDS SCHOOL OF ART.

THE annual meeting of the Leeds School of Art was held on Tuesday week, when the prizes were distributed. The committee report the progress of the Institute as satisfactory, particularly in the Art School, 145 students having entered during the session ending Midsummer, 1871—23 in the day classes and 122 in the evening. One noticeable feature in the attendance has been that many students entered and remained in the classes only a short time, without producing works or preparing for the examinations, only 125 having done anything for the examinations, and many of them have been so short a time in the school that their work was neither sufficient in quantity nor quality to satisfy the examiners. The success of the school has been chiefly earned by those who have attended regularly for the whole or greater part of the year. Seventy-eight students sent drawings to London for examination, with the excellent result of one prize in the national competition, and 17 third grade prizes; 120 were examined in the second grade, of whom 87 passed, 14 of them passing "excellent" and obtaining prizes. The class for teachers in training has been eminently successful, six having completed the art master's certificate of the first group. This is an unprecedented number of certificates taken by students trained in one provincial school. Six elementary certificates have been taken giving the qualification to give instruction in day schools and art night classes. The special class for scientific drawing—the subjects being practical, plane, and solid geometry, machine-drawing, and building construction—conducted by Mr. Tinker, has been attended by twelve students, who have obtained two prizes and seven certificates. The chemistry and dyeing by Mr. Jarman, and weaving and designing by Mr. Mills, have been moderately well attended. The financial position is satisfactory, as sufficient funds are in hand to meet all expenses.

THE ROMAN VILLA AT NORTHLEIGH, NEAR OXFORD.

MR. J. P. EARWAKER, the hon. secretary of the Oxford Architectural and Historical Society, gives the following account of the Roman Villa at Northleigh, near Oxford:—

"It would be needless to dilate upon the extreme value and importance of these remains of Roman art and civilisation in the immediate neighbourhood of Oxford. There are few, if any, of the very few perfect Roman villas in England which can compare with this one either as to size or extent, or as to general preservation, and there is certainly not one which is more appositely situated for being studied by those interested in the ancient civilisation and art of which it is such a valuable relic. Such, however, is the present condition of the remains that unless some immediate steps be taken, the care and attention paid to their preservation when originally uncovered in the years 1815-16 will have been in vain."

"The remains as at present existing consist of the foundation walls of a very extensive quadrangle, with its adjacent rooms and porticos, and of one or two chambers, in a more or less well preserved state. On the north side this quadrangle measured 167ft. in length, on the east side 212ft., on the south side 153ft., and on the west side 186ft. The number of the chambers which were either wholly or partially uncovered amounts to over 60, many of which had their tessellated floors well preserved, whilst in others only slight traces of tesserae were discoverable. At present these walls are little more than grassy mounds; they have been left neglected and uncared for, and openly exposed to the weather; and in many cases it is almost impossible to follow the plan of the quadrangle and adjacent rooms."

"Of the few chambers which were discovered in a more or less perfect state, the more important is that situated in the north-west corner of the quadrangle. This room is 33ft. long and 20ft. broad, with walls of more than 3ft. in thickness. Below the floor of this room is the hypocaust, extremely well preserved, and the curious pillars made of tiles which support the floor are still quite perfect. The funnels in the walls by which the hot air flowed into the rooms, and the flues by which the smoke of the fires escaped, as well as the præfurnium, or place where the wood fire was made in the hypocaust, are well shown. There are 79 pillars in all, which support the tessellated pavement, and raise it some three feet above the floor of the hypocaust. This tessellated pavement, which is of a very simple and elegant pattern, was, when discovered, almost perfect."

"Such was the interest taken in these remains when they were discovered in 1815-16 that a subscription was raised in Oxford, whereby a substantial shed was built over this room and one or two others, and it is to the present dilapidated condition of this shed that I would direct attention. One of the main beams which supported the roof has rotted away and partly fallen on the tessellated pavement below, whilst the thatched roof has also given way in many places, and so affords no proper protection against the weather. Thus, after very heavy rain a portion of the pavement is in a pool of water, which seriously injures and loosens the tesserae. A small sum of money would suffice to put this shed into a state of thorough repair, whilst the longer it is allowed to continue in its present state the greater will be the trouble and expense of repairing it, independent of the damage which must accrue to the tessellated pavement. At the northern corner of quadrangle are the chambers containing the hot and cold baths, which when found were very perfect, but of which now only the former is well shown, but in a very dirty and neglected condition. On the north-eastern side of the quadrangle a large chamber 28ft. long by 22ft. broad, was discovered in 1815, on the floor of which another very beautiful tessellated pavement existed in a very perfect state, and it is stated that a building was erected over it to keep it from decay. Of this building no vestige now remains; the tessellated pavement, if not entirely lost, is hidden by the grass and weeds which have grown over it, and which render it very difficult to recognise even the site of the chamber. Indications of other pavements were found during the excavations in 1815-16, but not fully examined, and many rooms were hardly explored at all. It would be very desirable if the whole of the remains could be again carefully explored, as there is but little doubt that much of a very interesting character would be discovered. Of the Roman villa found at Stonesfield in 1711-12, and reopened in 1779, no remains are believed now to exist, with the exception of a small portion of the tessellated pavement preserved in the Ashmolean Museum. Even the very site of this villa, of which the area was traced to be about 190ft. by 152ft., can now with difficulty be recognised. During the making of the Great Western Railway some little distance beyond Northleigh and Stonesfield, another tessellated pavement was cut through, and no regard being paid to it, it was entirely destroyed, and the materials used on the line, so that it is now impossible even to fix its site."

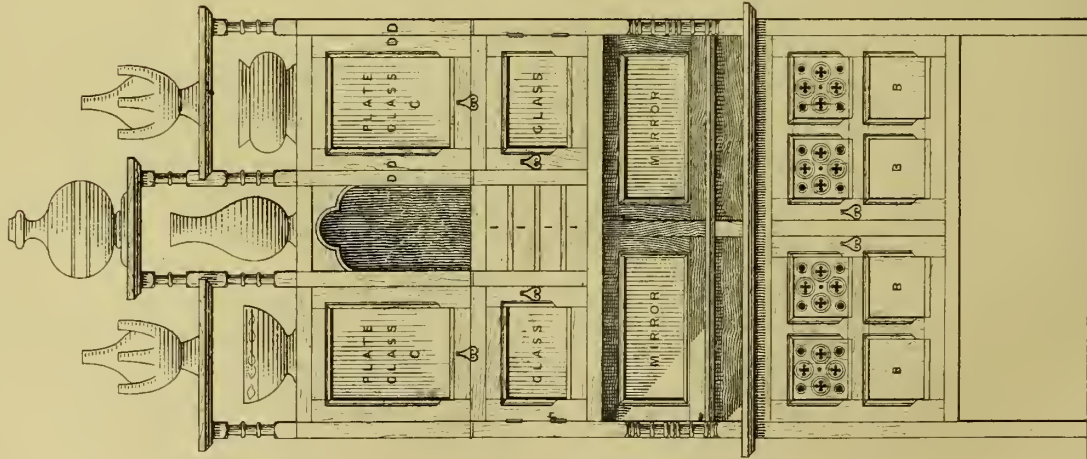
"It was in order to prevent the remains of the Roman villa at Northleigh disappearing, like those just referred to, that the committee of the Oxford Architectural and Historical Society in the summer of this year laid the present state of the remains before the Duke of Marlborough, on whose estate the villa is situated. It was somewhat confidently hoped that the same zeal which he displays in political Conservatism would also be shown in antiquarian conservatism, and that he would give orders to have the necessary repairs executed before the winter set in. Up to the present time, however, no reply has been received by the Society, and on visiting the villa on Tuesday week I found that not only had no repairs been carried out, but that no attention whatever had been paid to them. Under these circumstances we can only hope that by the voice of public opinion something may yet be done; for it cannot surely be considered a creditable thing in this nineteenth century to suffer such interesting remains to be destroyed."

COMPETITIONS.

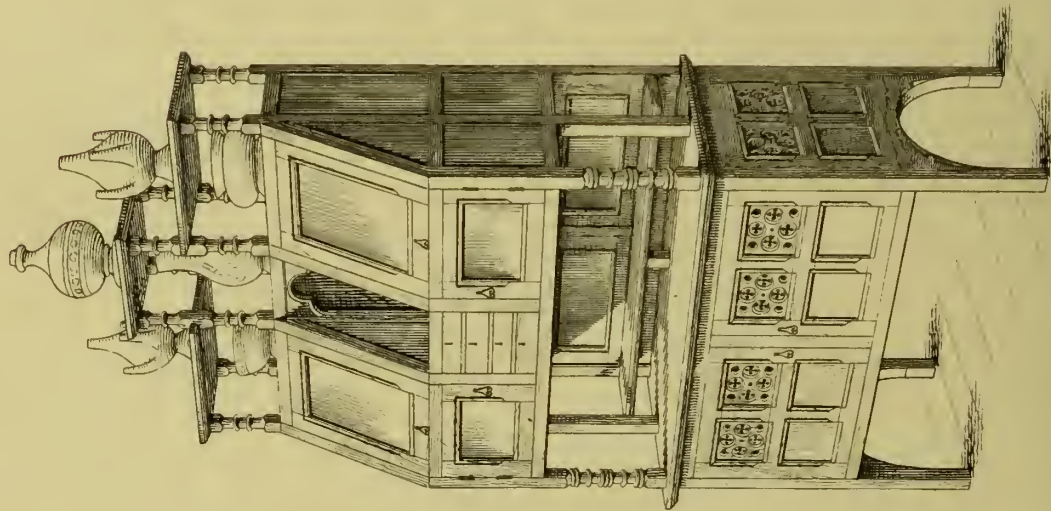
THE CAMBERWELL VESTRY-HALL.—The *South London Press* says that exception has been taken to several points in its article (to which we referred last week) on the plans of the New Vestry-Hall, Camberwell. Our contemporary says: "We are not surprised at this, nor will the public be when they understand the extreme difficulty under which the article was produced. The eight selected plans are hung in the Vestry-Hall for the inspection of vestrymen, not of the public; and so jealously are they guarded—from which motive we will not venture to suggest—that even the representatives of the press are forbidden to do more than glance at them. In determining to give the public an idea of the plans, therefore, we had to obtain the services of an architect, who, in his turn, had to make a furtive examination of the plans in the gloom of a December day. It is not very surprising, therefore, that 'Thorough' should have been misrepresented to the extent of its being supposed that his building, consisting of right angles, could not be placed on an irregular site—provision having, it appears, been specially made to meet the contingency—or that 'Experience' should have cause to complain of injustice done his designs through hasty inspection."

ART FURNITURE COMPANY. THE 'FLORENCE' CABINET.

EDWARD W. GODWIN, ARCHT.



FRONT ELEVATION.



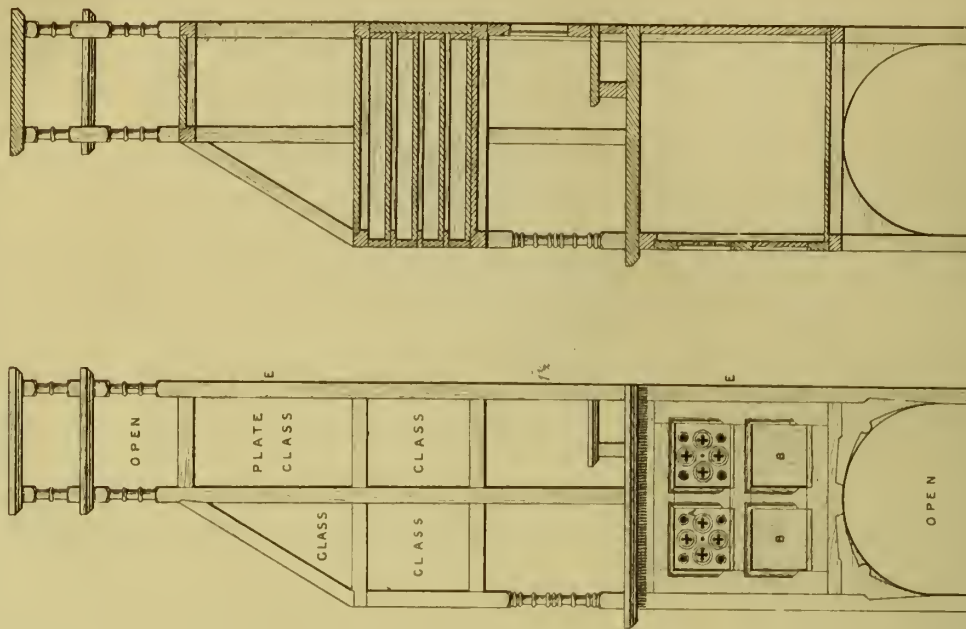
PERSPECTIVE VIEW



PANEL PIERCINGS.



HANDLE.

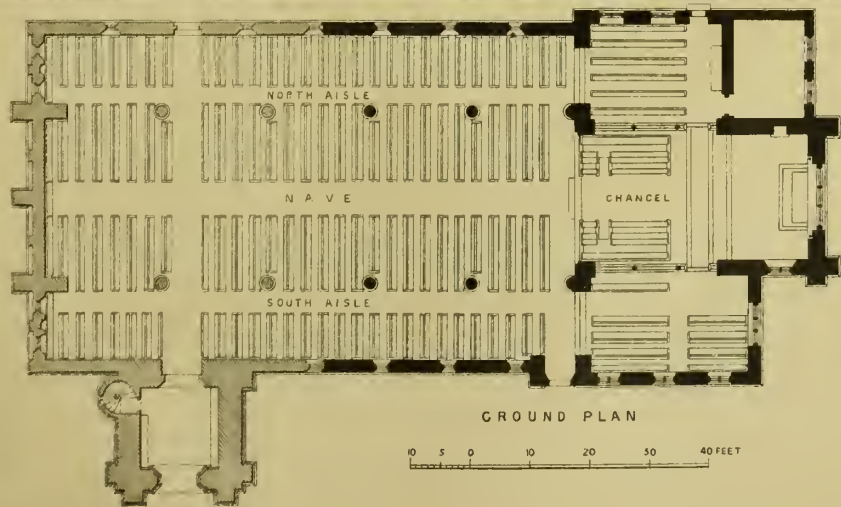
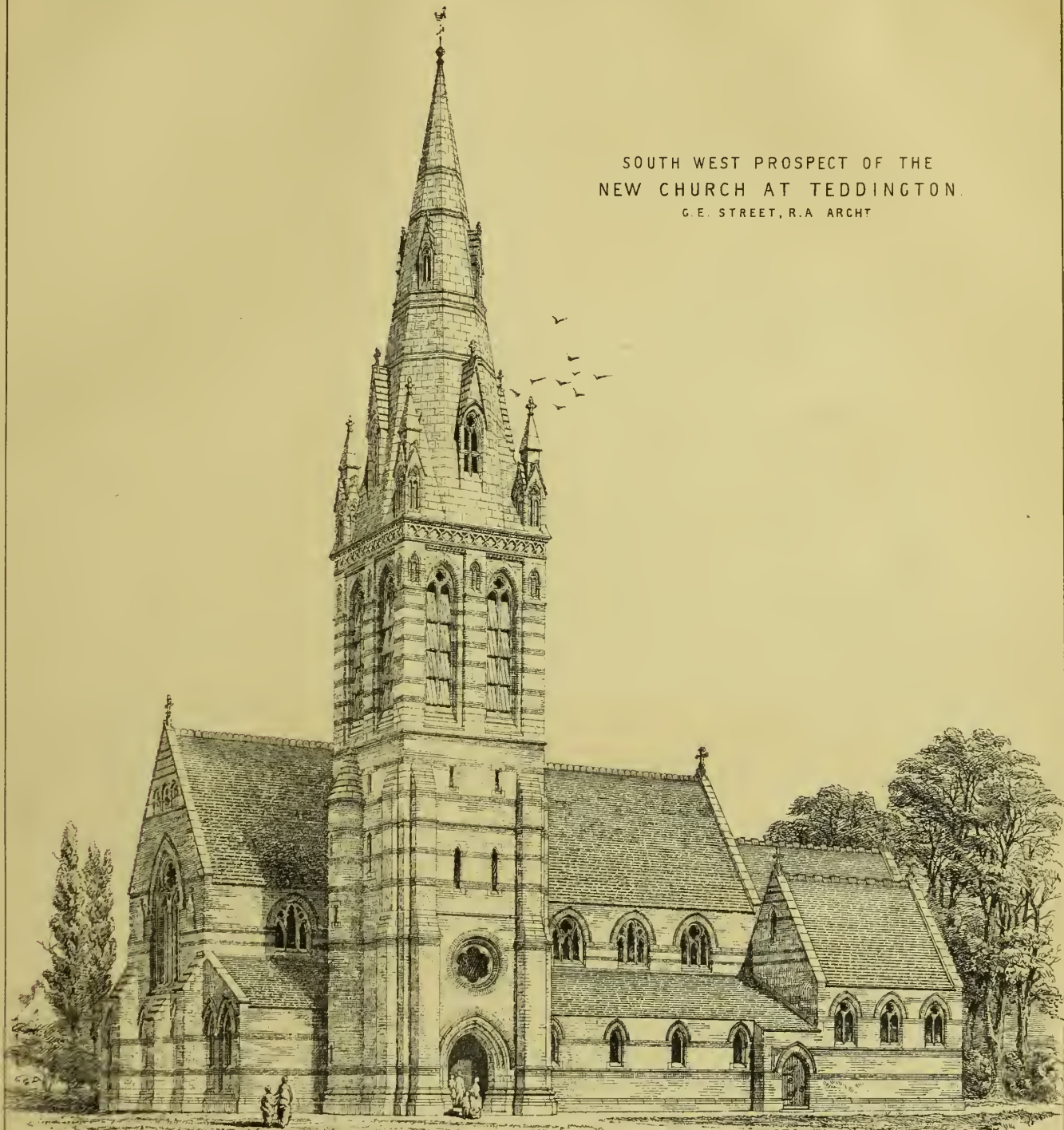


SIDE ELEVATION.

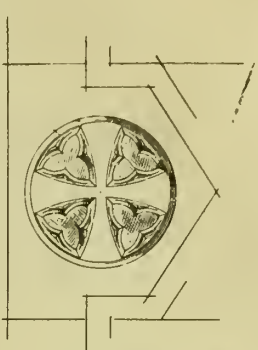
SECTION.

A. PIERCED PANELS. B. PLAIN DO. C. TO BE HUNG WITH BALANCE WEIGHTS TO 'LIFT UP'. D FLUSH. E INDICATES POSITION OF SHELVES. ALL THE 1/2 INCH FRAMING TO BE SQUARE. THE PANEL FRAMING 2 x 1.

SOUTH WEST PROSPECT OF THE
NEW CHURCH AT TEDDINGTON.
G. E. STREET, R.A. ARCHT







Mass in front of front and
vertical is upper floor plates

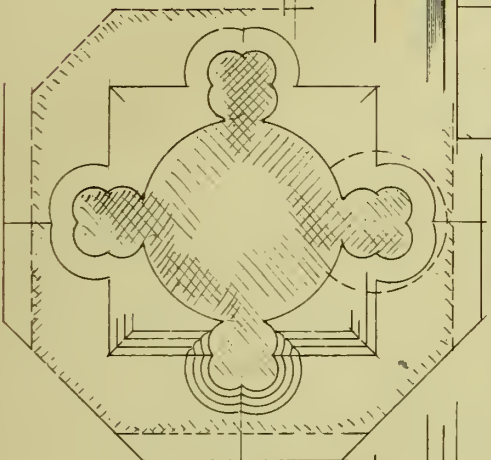
one circular line plate

Side elevation of front

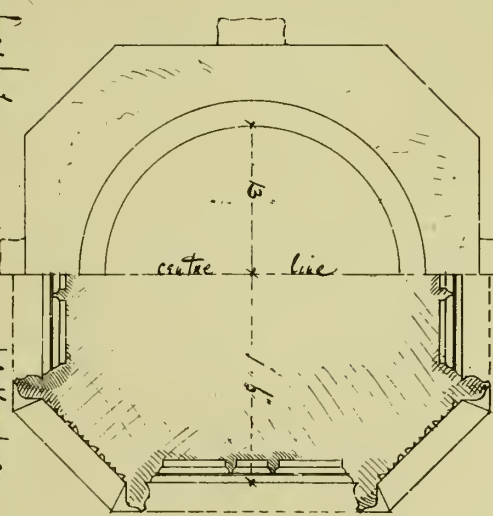
the window line shows and
vertical line shows

floor line

floor line

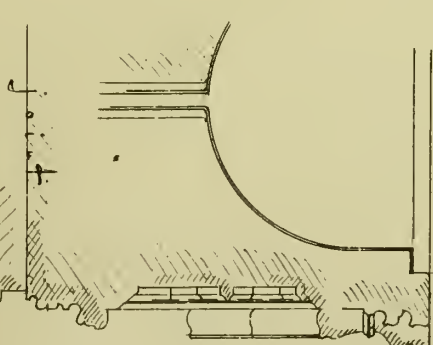


half plan of front



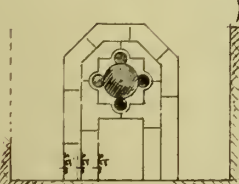
half plan of C

section from side



concrete bed
also the concrete up from 18 inches below floor

floor of front
gates are separated by 18 inches

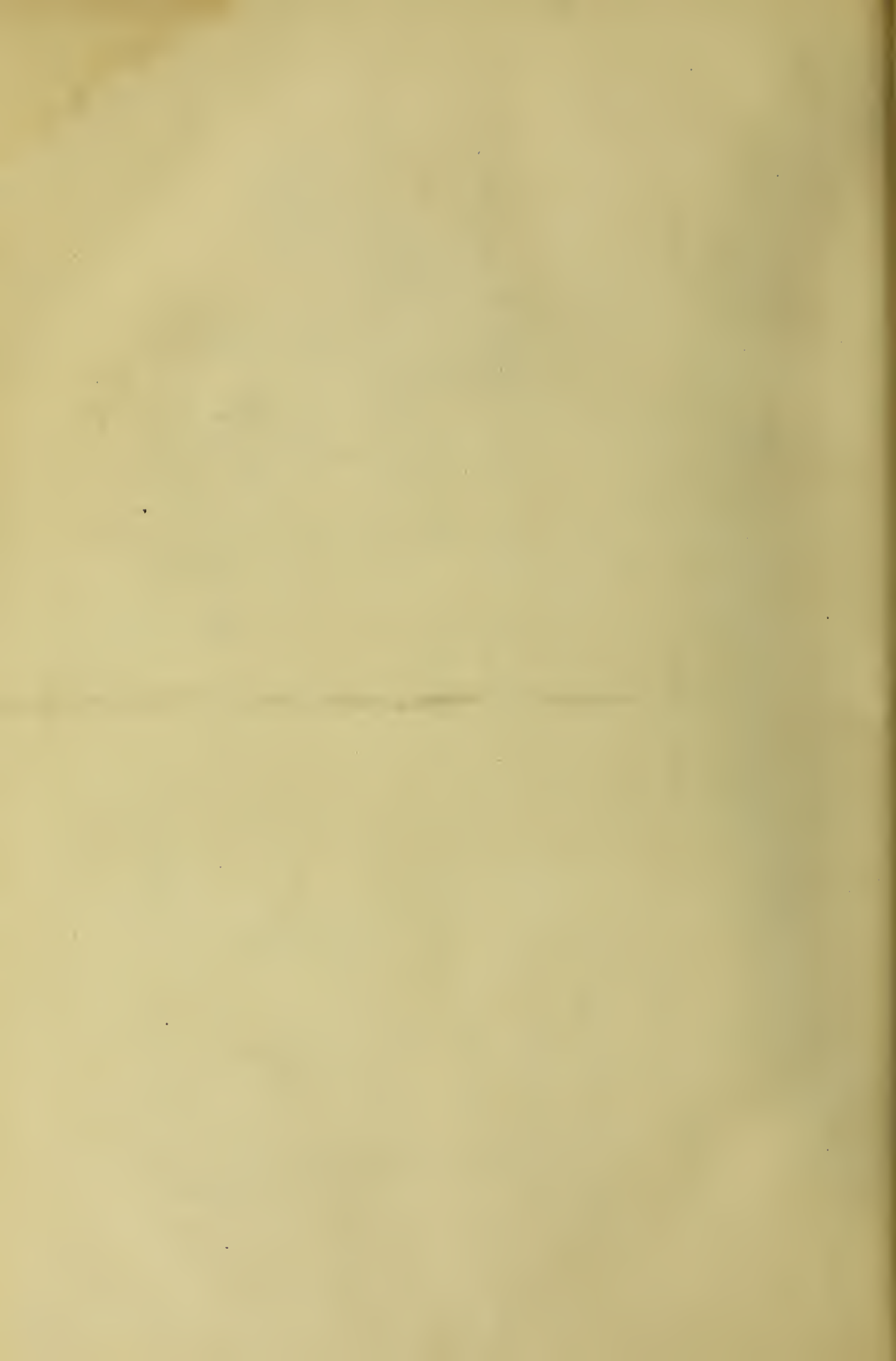


front elevation of cross

Detail of front
Scale 1/2 inches to one foot

It is executed in two pieces of good cast iron
given ground from living to back and back from back side with
cross plate and chain

each side to be provided where needed for iron work



ASPHALTE AS A STREET PAVEMENT.

IF something is not done, and done quickly, to improve asphalt as a material for street pavements, we expect it will soon be condemned by the general voice of the public. The accidents that occur daily in Leicester-square and Cranbourne-street, by horses falling, and sometimes killing themselves, are numerous and appalling. The inhabitants of the district are taking the matter up, and the following is a copy of a bill which can now be seen in almost every shop window in Cranbourne-street:—

TO THE INHABITANTS OF LEICESTER-SQUARE AND CRANBOURNE-STREET, SOHO.

A considerable diminution of carriage traffic through Leicester-square and Cranbourne-street having for some time past been perceptible, and it having come to our knowledge that coachmen have received strict orders to avoid these thoroughfares in consequence of the numerous accidents caused by the (at times) slippery and dangerous condition of the asphalt paving, we, the undersigned, hereby call the attention of the inhabitants to the advisability of taking steps to remedy the evil complained of, in order to prevent the probable loss of business by the diversion of the best of the traffic, to the ultimate serious injury of the ratepayers occupying houses in the above thoroughfares.

(Signed) Charles Webb (Stacey & Co.), 45, Cranbourne-street; Henry R. Willson, 8, 10 & 11, Cranbourne-street; E. Tarbox, 13, Cranbourne-street; Samuel Mitchell, 47, Cranbourne-street; Delagarde & Co., 42, Cranbourne-street; Mr. Marchant, 4, Cranbourne-street; Mr. Reardon, 3, Cranbourne-street.

We do not know what steps will be taken either to compel the authorities to take up the pavement or to improve it, but doubtless something must be done. It has been suggested that the pavement should be kept constantly wet, as when wet horses do not slip on it more than on granite pavement, or probably not as much. But keeping the new pavement constantly wet would involve a large item of expense, which neither the company nor the ratepayers would like to pay. So far, then, with all the writing-up and praising of asphalt, and with all the nursing it has received from city engineers and surveyors, it is a failure, and strange to say the BUILDING NEWS is the only metropolitan journal that has from the very first insisted on the inefficiency of the new material as a pavement for London streets. A question of no small importance is suggested as to the legal responsibility of the authorities in reference to injured, disabled, or killed horses. Who is responsible for the losses thus entailed on individuals? Somebody is, or ought to be; and the sooner this part of the question is settled the better, as on it hinges the extended use of asphalt for paving purposes.

PEDESTALS.

By THOMAS MORRIS.

(Continued from p. 479.)

IF, at the battle of Hastings, fortune decided in favour of strong and settled rule, a higher state of learning, advanced civilisation, and a foundation for the gradual elevation of the great masses of the nation, there is surely much to be thankful for. "All true-hearted Englishmen," says Dr. Bruce, in his "Elucidation of the Tapestry," "must read with peculiar interest this portion of our country's annals. The era treated of was the crisis of her fame—she survived the shock of the Conquest, and was benefited by its rough discipline." The suggestion, therefore, of a commemorative erection will, I trust, shock none, and be acceptable to many. The Society of Antiquaries did a valuable service in sending Mr. Charles Stothard to copy the whole of the *Toile de St. Jean*, as the Bayeux needlework is called. It is represented in colours in *Vetusta Monumenta*, and described in the "Archæologia." Mr. Daniel Maclise has shown how the highest powers of modern design could be applied to the subject in a series of illustrations issued by the Art Union Society in 1866. Here, however, may arise a question between the antiquary and progressionist, into which I do not propose to enter. Mr. Hudson Gurney thought colour essential for an adequate representation, and

if that view were adopted terra-cotta might be called into request—not, perhaps, shining majolica, or vitreous della robbia, but something hard, impervious, and indestructible as adamant, without a glaze.

By way of note to equestrian statues, I may allude to the model of a "Wellington" in the International Exhibition, 1871, by Mr. Adams, as one of those rare instances in which the pedestal is designed in artistic association with the rest of the work. The pedestal is here ornamentally treated. The sides are chased with panels of bas-relief, and free groups of insignia and allied objects enrich the ends.

In recent years only has the embellishment of London by works of art in public places been pursued upon a recognised principle. When tributes in statuary have heretofore been paid to high desert, they have commonly taken a cabinet character, and have been placed in the interior of edifices. Hence St. Paul's is rapidly filling up, and masterpieces are so closely crowded in Westminster Abbey as to obscure each other. The contemplation of some is a matter of difficulty, if not wholly impracticable. Mural designs have necessarily been frequent where vertical superficies has been more at command than floor space. The Abbey contains some remarkable examples of this class, and among the earliest and largest is that to Baron Hunsdon, cousin and chamberlain to Queen Elizabeth. It occupies the place of the altar in St. John the Baptist's chapel, and is an eminently pompous example on an Italian motif, showing how soon Rome began to influence our architecture after her supremacy in religion had been annulled. It illustrates also the introduction of a feature that took fashionable precedence of almost every other. This was due to a celebrated event in the Papal capital; and as it concerns my subject too directly to be entirely ignored, may be noticed here. Egypt was the mother of the pyramid, the most enduring of constructed forms; and being thus allied to notions of eternity it was employed for tombs by the great and wealthy. The chief are at Gizeh, but they are found throughout the land. They were occasionally emulated by the Romans. The mausoleum of Scipio Africanus was something of the same figure, with a podium and surmounting statues of Scipio and his friend the poet Ennius. The most perfect at Rome is that of Caius Cestius, a man of importance in the Augustan age. (One of the bridges bore the name.) It is engraved by Piranesi, who also illustrates the decoration of the sepulchral chamber in the midst. The pyramid derives its name from resemblance to a group of sun's rays, and might upon its merits have remained eternally Pagan. The Roman conquerors, prone as they were to appropriate the treasures of those they subdued, could not carry off the pyramids of the Egyptians. But there were beautiful objects of an allied character, representing, not a full pencil, but a single ray, or finger, of the sun. The Arabs call them Pharaoh's needles, and the Italians *agluggia*. They were placed in pairs at the entrances of temples, and two at Luxor retain their original position. They are each about a hundred feet high, and in a single block of elephantine granite. To remove such objects did not transcend the wonderful power of the conquerors, and many were transported to Rome. In the course of subsequent disasters, however (a dark eclipse of human pride), they were prostrated and left for ages in forgetfulness and neglect.

With Cardinal Montalto's accession to the Papal throne as Sixtus V. came new honours for the obelisk. This pope was the steady patron of Domenic Fontana, and employed him on the cupola of St. Peter's. There was lying in the rubbish near the old sacristy an obelisk that had been brought to Rome in the reign of Caligula. It was 111 palms long and twelve palms wide at the base, but it may be mentioned that they were rarely, if ever, a perfect square on the plan. The project of erecting this obelisk in the middle of the Place St. Peter had been entertained by previous pontiffs, but the difficulty of the task had prevented the execution. Sixtus determined to signalise himself by its performance, and addressed himself to the whole science of Europe. More than five hundred schemes were, in consequence, submitted to the Pope, and by him handed to Fontana for consideration

—an ordinary case of competition, in fact.* Fontana now produced his own plan, tried it successfully on a smaller example, and then commenced the greater work, of which he has left an illustrated account. The obelisk being strongly cased in timber, and a wooden roadway laid down, the business of removal began. Nine hundred men and a hundred and forty horses were employed. Their efforts were regulated by trumpets, and their halts by cymbals. At length, on the 10th September, 1586, the day of the Duke of Piney Luxembourg's arrival at Rome as ambassador from Henry III. of France, the obelisk rose majestically towards the heavens, and took its place upon the pedestal prepared for it, to the great joy of the people. The workmen raised Fontana on their shoulders and paraded the city, accompanied by music and cheered by loud acclamations. The Pope struck medals, ennobled the architect, and besides large grants of money, gave him all the materials and plant used in the work.

It is superfluous to say that the pedestal was not at all of the Egyptian school. Fontana in no way designed to consider the native bases of such objects (which were simple stylobates, each in a single unmodelled block with sides inclining more than the shaft), but gave the same plinth, die, and cornice as he would have done for a Roman column. Let it suffice that the obelisk, exorcised from the stain of ancient idolatry, was received into the ranks of Christendom, and treated with all the favour of a proselyte. It was posted in every possible position, in church and out of church. Gardeners cut it in their topiary work. It served for honorary memorials, as in the cases of Lieutenant Bellot, at Greenwich, and Aldermen Wood and Walthman, at Farringdon-street. In Mediæval days, a cross would have marked the meeting of several roads, but the taste of a later age decreed that those from Westminster, Waterloo, and Blackfriars bridges, should converge upon "The Obelisk." It was long the favourite ornament of important entrances, and still abounds in the unrenovated haunts of the aristocracy. In Lord Hunsdon's time the achievement at St. Peter's must have been the daily theme of admiring discourse, "familiar in the mouth as household words." He died within ten years of that famous event, and his tomb is adorned with a complete family of obelisks, in every stage of growth, from infancy to fully-developed maturity. With Elizabethan and Jacobean design the figure is intimately and indelibly associated; and it was only as architects became acquainted with the elements and principles of the Italian revival that they learnt to omit the obelisk in classic compositions. In the foremost ranks of the reformers I am disposed to place James Gibbs. He was born in Aberdeen in 1674, and educated at Marischal College, where he displayed a mathematical bias, and graduated M.A. He went to Holland, and entered the service of an architect and builder there. This kind of service is now, perhaps, too generally despised, since the preparation for a merely academic examination cannot effectually compensate for the absence of practical and experimental knowledge, though that knowledge be the fruit of diligent observation only, with unroughened hands. The Earl of Mar, a statesman fond of architecture, was also in Holland in the year 1700, and perceiving the genius of Gibbs, assisted him with money and introductions. Gibbs went to Rome, and having passed some years in assiduous study came to England in 1710, when his patron was in the Ministry and in high favour with the Queen. The earl recommended Gibbs to the commissioners for building the fifty churches, and we have evidences of his ability in the churches of St. Martin-in-the-Fields, and St. Mary-le-Strand. To these it must be sufficient to add the Radcliffe Library at Oxford, which he described in 1747 when he was F.R.S. He died a bachelor in 1754, bequeathing a property of about £300 a year to Lord Erskine, the son of his patron.

* Camille Agrippa, an architect of celebrity at Milan, had published at Rome in 1583, during the pontificate of Gregory XIII., a proposal for removing the obelisk, but there seems to have been some degree of jealousy between the Pope and the Cardinal, which possibly extended to the architects they respectively favoured. The death of Gregory threw the patronage into the hands of his successor, and Agrippa was not practically associated with the work. G. Della Porta and B. Ammannati were at first joined with Fontana, but by his interest with Sixtus, were eventually withdrawn.

MODERN ARCHITECTURE AND THE NEW
LAW COURTS.*

THE simple fact of two such buildings as Sir Robert Smirke's British Museum and Mr. Street's Law Courts being erected in the same city, so near to one another, and within so few years, for interchangeable purposes,† is as manifest a confession as can be made that we have no style of architecture, and do not know what to be about. Of the two absurdities the Gothic is perhaps the less absurd. Since—as the *Saturday Review* boasts that it has repeated weekly for years past, and promises to go on reiterating while it lasts—we are Englishmen, and not Romans or Italians, and still less Greeks, there is something to be said in favour of a style which was born and bred in this country. But even then it is only half the truth. We are Englishmen, but we do not live in the thirteenth century, and there is a greater difference between the rude baron or the domineering priest, and the abject middle classes of our Middle Ages, than there is between the educated and refined upper classes in England at the present day and the polished Roman of the first centuries after the Christian era, or the Italian gentleman of the sixteenth or seventeenth century; and the art of the latter is therefore more appropriate to our state of civilisation than that which expressed the wants and feelings of our semi-barbarian ancestors five centuries back.

Fifty years ago, when the Gothic system was first introduced, men were content with the thinnest film of Gothic detail spread over the walls of a thoroughly modern building. True, this was an offence against good taste; but the wants and conveniences of modern times were still attended to. We have now become such purists that if any detail of the exterior, any internal arrangement or article of furniture, betrays the secret of the age in which a nineteenth century building is erected, the architect is condemned as a bungler, and as ignorant of his profession. Alone of all the arts, architecture is now retrograde, and admits of no progress; and as the Gothic branch of it has now come to be practised in this country, instead of being merely an offence, it has become a standing insult to the age in which we live.

If the practice were to stop with this last example, there would probably be no harm done. The new Law Courts might, like the frightful example of the itinerant preacher, serve as a warning, and their inconvenience and inappropriateness might prevent the repetition of such Mediaeval productions; but, unfortunately, we are threatened with even worse things, and the history of the new buildings about to be erected at South Kensington to accommodate the Natural History Department of the British Museum is too instructive an illustration of the system to be passed over in this place.

In 1864, when the Government first entertained the disastrous resolution to break up the British Museum and send one portion of it to South Kensington, a competition was instituted for designs for the requisite buildings. Thirty-three architects competed, and a committee of those whom the Government thought most fitted for the task was appointed to select the three best designs. The committee had not a moment's hesitation in awarding the first prize to a design which was undoubtedly the best of those sent in, and which it appeared to them was not only appropriate for its purpose, but would also be an ornament to the metropolis. Great, therefore, was their surprise and amusement when the seals were broken, and it was found that this design was by the redoubtable Captain Fowke. Their astonishment arose from the fact that up to that time Captain Fowke was only known from some terrible things he had done at South Kensington. His first designs were such as a schoolboy draws on a slate, and his 1862 Exhibition Building was only fit to be pulled down. But he was a man of architectural instincts, and, had he been educated as an architect, and escaped the trammels of the Copying School, might have done wonders. As it was, he was brought up as a military engineer, and set to work to design and carry out civil buildings before he had mastered the most elementary principles of the art. He failed, of course; but ten years' experience—at the country's expense—had enabled him to remedy the defects of his early education, and his natural aptitude for the art at last enabled him to realise this very beautiful design. It was neither Grecian nor Gothic, but thoroughly nineteenth century; and had he lived and been allowed to carry it out with such ameliora-

tions as further study would have enabled him to introduce, his building would have marked an epoch in the history of architecture in this country.

Dis aliter visum. One fine morning the Government, worried and perplexed by the rival claims of the competing architects, issued an ukase which was intended to settle the whole question. To Mr. Scott, as the Goth of the Goths, it was given to design and carry out the Home and Colonial Offices in the Italian style. To Mr. Street was awarded the Law Courts, because his design was the worst—a perfectly competent tribunal having awarded him only three marks in the competition, while it had assigned Edward Barry forty-three. But as a sop to keep the latter quiet—which does not, however, seem to have proved a successful expedient—he was given the new National Gallery. Because Messrs. Banks and Barry had some claim on the Government in respect to a War Office competition, they were given the Burlington House buildings; and lastly, because Mr. Waterhouse was supposed to have earned a claim by what he had done in the early stages of the Law Courts competition, to him they awarded the task of carrying out Captain Fowke's design for the Natural History Museum.

It would be difficult to conceive a process more insulting to the judges, or more detrimental to the encouragement of architectural art, than this was, and has proved to be. Government, it is true, to save their responsibility, always insert clauses to protect themselves from legal damages in the event of their doing what they know to be a violation of the spirit of their agreement. Practically, however, no architect enters upon a competition except on the understanding that, if his design proves to be the best, he will not only get the first prize, but be employed to carry out his design. The prizes, however large, never cover the cost of a competition; and when to the cost we add the waste of energy and time, and the mental anxiety involved in the process, no man in his senses would compete if he had not faith in his judges, and confidence that the only prize worth having would be awarded to him who best deserved it. There is an end of all faith in the justice and discrimination of Government when, in defiance of this understanding, it is found that an official with no special qualifications may any day tear up all the awards of the judges, and then proceed to distribute the prizes according to his own caprice, or according to the pressure brought to bear upon him. Such a system is degrading to the profession, and it is very creditable to it that the public are still so well served, and our public buildings not infinitely worse than they are.

If the Government had any serious intention that Captain Fowke's design for a Natural History Museum should be carried out, they would have insisted on a pledge that this should be done with only such changes and ameliorations as the original architect himself might have introduced. Nothing of the kind was done; and what might have been foreseen as inevitable soon came to pass. Mr. Waterhouse's position as an architect did not allow of his carrying out any other person's design, much less that of a soldier-officer. He consequently very soon produced an entirely new design of his own, in what he is pleased to call the Norman, or according to the more fashionable modern euphuism, the "Byzantine" style, though what its connection may have been with Byzantium I do not know. As Mr. Waterhouse very well knows, it is no more Norman than the British Museum is Greek. It is a modern building, with large openings filled with plate-glass. The roofs are fitted with skylights; swing doors, modern fireplaces, plate-glass cases, and every other nineteenth century contrivance, is sought to be introduced; but he escapes from the difficulty of designing details appropriate to the present age, under the pretext that the rude clumsy ornament he is using is correct Norman.

If this building were as truly and essentially Norman as Mr. Street's is thirteenth century, it would be so intolerable that it could not be erected. Some people think we may safely go back as far as the time of Edward III., but no human power would force British science to be content with the dark dungeons that graced or disgraced our island in the troublous times succeeding the Conquest.

Mr. Street's design, again, fails from exactly the opposite quality. It is the accuracy of imitation pervading every detail that makes it so perfectly intolerable. According to this Joshua of architects, the sun of art stood still when Edward III. died in 1377, and has not moved forward since that time. Hence the lawyers of the nineteenth century must be content to lounge in vaulted halls, with narrow windows filled with painted glass, and so dark that they cannot see to read or write in them. They must wander through corridors whose gloom recalls the monkish seclusion of the Middle Ages. They must sit on high straight-backed chairs, and be

satisfied with queer-shaped furniture, which it is enough to give one the rheumatism to look at; and no higher class of art must be allowed to refresh their eyes than the heraldic devices or the crude, ungainly nightmare paintings of the Middle Ages. It is strange that educated men in the nineteenth century should desire this; but if they do, it is well they should have it in perfection. The more complete the *reductio ad absurdum*, the sooner the reaction will set in.

When the reviving taste for barbarism imposed a task of this sort on the late Sir Charles Barry, he submitted, as an architect must; but with characteristic common-sense he chose that form of Gothic which was least offensive to modern ideas. And he further gave it a dignity and grace which hardly belong to the style, by taking the licence of putting his design for the Parliament Houses into an Italian form. The Palace at Westminster is not perfect, but it has at least this merit, that its style is two centuries nearer our time than Mr. Street's, and thus incorporates all the improvements that were introduced during those 200 years. It consequently comes so much further forward, that modern improvements and modern art are not the complete discord which they would be in a building so essentially Mediaeval as the Law Courts are intended to be made. In so far as it is nearer our time it is better, but the public will hardly be able to measure this advantage till they feel the inconvenience of the more archaic building.

But the important question remains, Where is all this to end? When we have got our Tudor Parliament Houses, our Edwardian Law Courts, our Norman Museum, what is to be done next? One step backward we can still see our way to—there is the Saxon. Instead of repeating the vague term "Englishmen," representing a heterogeneous medley of nationalities, let the *Saturday Review* use the more definite term, and ask, Are we not "Saxons?" With sufficient iteration its claim must eventually be admitted, and ought to be; for besides its undoubted ethnological claim, it has two merits of its own. We know so little about it that it admits of considerable latitude of design, without offence to archaeologists, and its details are so rude and lean that they must be cheap. Let the Government, then, when they issue their proposals for a competition for the new War Office, for once make up their minds beforehand, and specify the Saxon style as that to be adopted. It will admit of some novelties, and be quite as appropriate to the wants of the nineteenth century as the Norman or Edwardian styles.

When, however, we have thus completed our *hortus siccus* of dried specimens of dead styles, the prospects of the next generation of architects will be dark indeed. There will only then remain the so-called Druidical style of the Ordnance Survey. At present no doubt it is inconvenient and somewhat draughty; but if plate-glass and modern refinements may be used with the Norman, why not with the Druidical? I do not feel by any means sure that a stuccoed Stonehenge, with a glass and iron roof, would not be as good, perhaps a better representation of the architecture of the nineteenth century than many buildings which have recently been erected.

But to return to the Law Courts for a few minutes, before concluding. The particular crotchet which, besides its anachronism, renders the principal façade so unsatisfactory, is Mr. Street's determination to insist on his great vaulted hall. In his first design this hall was placed east and west, in the centre of the building. It was not seen from the outside, and was useless inside. It was therefore harmless, except that it increased the expense enormously, while it darkened the lights, and rendered the courts and passages around it noisome and inconvenient. In addition to these trifles, however, it may be added that it is not Gothic, for so far as I know no such vaulted hall was erected for any civil purpose in any country of Europe during the Middle Ages.

In the new design the hall is placed north and south, and comes so near the front that the temptation was irresistible to justify its introduction by showing it, and making it a feature in the design. It could not, without destroying its supposed use, be brought quite to the front, like Westminster Hall, thus making it the central feature in the façade. It must consequently be seen in perspective at some distance behind, but in order to enable this to be done the façade must be cut in two; and more than this, all the nearer features must be kept small and subdued, so as not to dwarf the distant hall. All this is quite right and logical, if the hall is to be seen. But why the hall at all? If the Government had even now the courage to say to Mr. Street, "You shall not have your vaulted hall, but must introduce a glazed court, or such a hall as Mr. Waterhouse proposed in his design," they would not only immensely improve the convenience of the courts, but save the architect from a difficulty he does not

* By JAMES FERGUSON, F.R.S., in *Macmillan's Magazine* for January.

† That their purposes are interchangeable is evident from the consideration that thirty years ago Sir Charles Barry prepared a design for the Law Courts as purely and severely columnar Grecian as the Museum, which was adopted by Government; while, on the other hand, if a competition were now opened for a new museum, it is more than doubtful if a single Classical design would be sent in. But of this hereafter.

see his way out of. He could then close up his front and introduce a central feature, with appropriate wings, which would give some dignity and proportion to the whole design, and so save it from the scattered littleness which every one remarks, though few are aware why they are inevitable with the present arrangements.

No re-arrangement of the parts, however, can possibly remedy the real and fundamental error which is inherent in the whole design. If the Strand were the bed of a pellucid mountain stream, and this building were designed to be placed on its banks in some remote sparsely inhabited Midland valley, for the accommodation of a congregation of barefooted friars, we might admire the picturesqueness of its details, and shut our eyes to the anachronism in consideration of its appropriateness. It is difficult, however, to realise the frame of mind in which any one could sit down at the present day seriously to prepare such a design for a Palace of Justice in the largest and richest city in the world. If the Government, when the competition was proposed, had had the courage to proscribe both the Classic and the Gothic styles, there are many architects in this country who could have furnished both elegant and appropriate designs in styles perfectly suited to our wants and feelings. If, however, Gothic was admitted, one of two things seems inevitable. The building must either (like Sir Charles Barry's Parliament House or his son Edward's design for the Law Courts) be an Italian design in a Gothic disguise, or, if it is to be (as Mr. Street boasts that his is) a real fac-simile of the monastic or domestic architecture of the Middle Ages, it must be such as is only suited to that remote stage of civilisation, and both antagonistic to the taste and inappropriate to the purposes of the present generation.

ROYAL ARCHITECTURAL MUSEUM. TO ARCHITECTS AND EMPLOYERS OF ART- WORKMEN.

THE main objects of our Museum (which is situated in Tufton-street, Dean's-yard, Westminster) are the education of the architectural student and of the art-workman. It is with much pleasure that the Council feels itself for the first time in the position thoroughly to carry them both out.

While we were seated in Canon-row from fifteen to twenty years since, the work of the Museum was hindered by the debts incurred in its foundation, and by its heavy annual expenses. Relieved at length, as it were, from these impediments by our sojourn at South Kensington, the Museum only partially succeeded, on account of its distance from the centre of the town, and from other circumstances, in gathering around it, from time to time, select groups of those who had been interested in the original formation of the collection; regular and systematic intercourse even with them was impossible; while those who would have gladly given their energies to art-teaching were unable to continue the practical work began in Canon-row. So in lapse of time the Council determined on again seeking a site of its own, and on erecting a building somewhere in the old locality specially suited to its requirements. This has now been done; the inconveniences of South Kensington have been remedied; a heavy debt which until lately threatened to deprive the Museum of its powers for good, has been paid off, and the Museum is now free and in a position to carry out its original scheme of usefulness. It is not money that on the present occasion is sought (except in the way of the subscriptions of new members); it is the presence of larger numbers of visitors and of more numerous classes of students which the Council now desire. Beyond their valuable collection, well housed and well lighted, they are now in a position to provide for visitors many things in which they have hitherto been deficient—*e. g.*, desks and chairs, facilities for taking down casts, &c.—while they contemplate, if the number of attendances should require it, the re-opening of the Museum at night. The catalogue, too, is now in hand, and will be issued without delay.

1. To architects the Council might represent the value of encouraging the study by their pupils of such a collection: it is not too much to ask that a certain number of hours each week should be set apart as a rule for this purpose. Architects subscribing £1 1s. yearly can send a pupil daily and gratis any time between 10 and 4, and 10 and 9 p.m. on Saturdays. To non-subscribers the admission is sixpence. There are, too, the Architectural Art Classes in the building, established especially for architectural students, under the superintendence of a joint committee of the Institute of Architects, the Architectural Museum, and the Architectural Association, and with the great advantage, to those who will study it, of the fine collection. Architects also might do much in

constantly enriching the Museum, as old buildings pass under their care, by having casts of good carving taken.

2. To employers of art-workmen the Council can appeal for co-operation with especial force. Until this Museum was established the term "art-workman" was hardly known, still less was the individual; and now there are but few of that most useful class of artists who have not been students or prize-holders at the Architectural Museum. It is a revival of this systematic training of the men who execute the art-work of our every-day life that the Council long to witness. The results of their efforts up to the present time may be seen in almost every building erected in late years with any pretensions to decoration. Employers are urged to give their men time to enable them to learn that which is the very grammar of their art by permitting them to visit the Museum, not after the day's work is done, but during working hours. The privilege of leaving earlier than usual on Saturdays, when the Museum is open till 9 p.m., would probably suffice for this purpose, and the gain to the employer and the employed would be equal and considerable. The authorities of the Museum would most heartily welcome any suggestion, and do their utmost to meet the convenience of those to whom they now appeal to aid them in utilising, as far as may be possible, their unrivalled collection. Lectures on the different phases of art represented in the Museum, and prizes for studies from the various objects, form part of the scheme.

It is earnestly hoped that this circular will receive the consideration of those to whom it is addressed, and that any expressions of readiness to carry out its proposals or any suggestions may be forwarded without delay to the Honorary Secretary.

A. J. B. BERESFORD HOPE, President.
GEO. GILBERT SCOTT, Treasurer.
JOSEPH CLARKE, Hon. Sec.
(Address, 13, Stratford-place, London, W.)
December, 1871.

Building Intelligence.

CHURCHES AND CHAPELS.

BROOKFIELD.—A new Unitarian church, at Brookfield, Gorton, was opened on Wednesday week. The church consists of a nave 77ft. long, 21ft. wide; north and south aisles, each 70½ft. long, 10½ft. wide, making a total width of 42ft. inside; chancel, 25ft. long, 19ft. wide. The church contains sittings for 264 adults, 162 children, and 24 singers in the choir, in all 450 persons. Internally, the effect of the building is enhanced by the introduction of polished red granite columns between the nave and aisles, which divide the length into six bays. The arches are built of stone, with labels springing from carved corbels, having the lily, passion flower, and other emblematic foliage. The chancel floor is laid with Minton's encaustic tiles, of a rich pattern. The building has been erected by the general contractors, Messrs. Clay & Sons, of Audenshaw. Mr. Thomas Worthington, of Manchester, is the architect.

KINGSTON, ISLE OF WIGHT.—The parish church of Kingston, Isle of Wight, has just been reopened, after restoration under the direction of Mr. R. J. Jones, architect. The whole area of the church has been cleared of the pews, and the west gallery and stairs removed, while a new roof has been constructed and the south porch rebuilt. Mr. Morris, of Chale Green, was the builder, the new stained glass being by Lavers, Barraud, & Westlake.

PATELEY BRIDGE.—The Roman Catholic Church of S. Cuthbert was reopened on Thursday, the 21st inst., by the Rev. Bishop Ryan, of Bradford, after having been closed for some time during alterations. The unsightly gallery has been removed, and the old pews have been replaced by stalls. A handsome stone pulpit and reading-desk have been erected. The alterations have been carried out by Mr. Grange, of Pateley, from the designs of Messrs. T. H. & F. Healey, architects, Bradford. This is one of the Parliamentary churches of the early part of the present century. A system of decoration has been employed in order to deal with the unbroken monotony of the interior. The wall of the nave has been arranged in three divisions of colour. The dado is brown; forward to the springing of the window arches is citron, relieved between each window by a centre ornament containing the Christian emblems. Above that is of a deep buff, powdered with conventional roses and fleur-de-lis in brown. These divisions are marked by bold borders on vellum grounds. The chancel, reredos, and tablets are richly illuminated in both stencilled and painted ornament. The whole of the

decorations were entrusted to Messrs. S. Bottomley & Sons, of Crosshills, near Leeds.

WATH-UPON-DEARNE.—A reredos has just been placed in the old church of All Saints, Wath-upon-Deerne, which completes the restoration of that edifice, begun between two and three years ago by Messrs. Hadfield & Son, architects, Sheffield. The reredos extends across the east wall, forming a canopied arcade over the altar, and the incident related by S. Luke at Emmaus is cut in relief, in Caen stone, by Mr. Earp, of London, under the direction of the architects.

BUILDINGS.

HOGGESTON.—A new school-room at Hoggeston, near Winslow, Bucks, has just been completed. It is built of red Aylesbury bricks, relieved by gray bricks and dressings of Bath-stone. Internally the walls are faced with gray bricks, tuck-pointed. Messrs. Spencer, of Aylesbury, were the architects, Mr. Matthews, of Winslow, being the builder.

LAMBETH.—The "Royal Victoria Palace" (late the Victoria Theatre), Waterloo-road, Lambeth, was opened on Saturday last, having been entirely remodelled internally. In the BUILDING NEWS for the 8th inst., we described the works then in progress. The architect under whose personal superintendence the whole has been carried out is Mr. Robinson, of Haverstock-hill, the "Victoria" Palace being the third theatre which he has designed during the present year—the others being Hengler's Circus, Argyll-street, Regent-street, and the Pavilion, Whitechapel. The builder was Mr. Thomas Snowdon, of Harrow-road, Mr. Watson and Mr. Fullicks acting respectively as foreman and clerk of the works. The cost has been £6,500.

LEWES.—New schools for the parish of S. Ann's, Lewes, have been completed. The style is Gothic, the material principally used being large white flints, relieved by quoins and dressings of red brick. The architect was Mr. C. J. Berry, of Lewes, and the builder Mr. J. Pearless, of Eastbourne. The work has cost £800.

MANCHESTER.—The Manchester city police and sessions courts are now rapidly approaching completion, and the two courts, which are to be appropriated to the police business of the city, were formally opened on Wednesday. Mr. T. Worthington, the architect of the building, having received instructions to proceed with the preparation of plans, the old buildings which occupied the site, and which had previously been used as a stone yard, were pulled down by the corporation in May, 1868; and the contractors for the foundation and basement story commenced proceedings by building the wall forming the boundary against the canal, in the early part of June. Tenders for the superstructure were publicly advertised for, and that of Messrs. R. Neill & Sons was accepted. The style of building is that type of Pointed Gothic of which examples abound in Florence, Verona, Siena, and other cities of northern Italy. At the angle of Minshall-street and Bloom-street is a large and lofty tower, the lower portion of which is occupied by offices, and the upper by the clock, which has four illuminated dials, 8ft. diameter, and strikes a bell weighing upwards of a ton, placed in the arched chamber at the top.

TORQUAY.—A new wing to the Imperial Hotel, Torquay, has just been completed. The new wing consists of basement and ground floors, and three upper floors. In the basement are various offices and servants' bedrooms; on the ground floor is the *table d'hôte* room; on the floors above sitting and bedrooms. The *table d'hôte* room is 70ft. long by 35ft. wide, and 21ft. high, and lighted on each side and at the end by large windows, those towards the water commanding a fine view of Torbay. The room is warmed by two open fireplaces and by hot-water coils in the four corners. The chimneys are contrived in such a manner that the ranges of windows are continued above the fireplaces. The surface of the internal walls is broken by pilasters with ornamental capitals. Artificial light is supplied by massive gaseliers, manufactured specially by Messrs. Messenger, of Birmingham. Each of the upper floors is supplied with lavatories and servants' offices, and not only is the gas laid on in every room, but the wing is fitted throughout with the new electric bells. The new wing has cost £8,000, and has been erected from the designs of Mr. J. W. Rowell, architect, of Newton, by Mr. J. Matcham, of Plymouth. The gasfitting, bell-hanging, and hot-water apparatus has been carried out by Mr. W. J. Pople, of Plymouth, and Mr. S. Thomas, of Stonchouse, did the painting and plumbing. Mr. Richards was the clerk of the works, and Mr. J. Windsor the foreman.

WALWORTH.—The erection of a new parsonage-house in connection with and contiguous to S. Stephen's Church, Walworth-common, has been commenced. The architects are Messrs. Jarvis & Sons, Trinity-square, Newington, and the builder Mr. Thompson. The cost will be about £2,000.

TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

To OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

RECEIVED.—H. W.—W. H. L.—G. F.—J. B. S.—W. M. & Co.—J. O.—F. S., Belfast.—S. & Son.—An Intending Competitor.—T. G.—W. S.—T. G. R.

R. L. B.—See answer to H. Davis.

PLUMBER.—Your letter on house-drainage, &c., is in type, but, with other matter, is crowded out this week.

H. B.—Letter forwarded to Mr. Banister Fletcher.

J. H. TANNING.—The pamphlet has already been noticed in our pages.

H. DAVIS.—We do not forward answers to queries by post. Questions publicly asked must be publicly answered for the good of the public.

PLANNING OF HOUSES.—"An Intending Competitor" has asked a question about "computing the cubical contents of the several designs." "F. G." has asked "whether stables are to be included in the mansion and villa for the £7,000 and £2,000 respectively?" and "F. S." has asked some questions about certain offices not specified in the conditions. These questions will all be answered, and we hope satisfactorily, in our next number. At the same time, we should be glad to answer any other question legitimately bearing on the subject that may reach us on or before Wednesday next.

Correspondence.

DILAPIDATIONS.

To the Editor of the BUILDING NEWS.

SIR,—Permit me through the medium of your columns to offer a tribute of thanks for the very able series of articles that have recently appeared in the BUILDING NEWS on the above subject from the pen of Mr. Banister Fletcher. Mr. Fletcher is personally unknown to me, but I cannot help acknowledging that a subject of importance has been carefully and conscientiously treated by him in a style that has greatly relieved that dryness which is the almost necessary accompaniment of technical and practical matter. The articles, taken together, deserve, in my opinion, to be considered by the profession as a book of reference on dilapidations.—I am, &c., W. W.

CAMBERWELL VESTRY-HALL COMPETITION.

SIR,—In case the letter by "One of the Unfortunate Sixteen" in BUILDING NEWS of 22nd inst. should be considered truthful, if not contradicted, I am unwillingly induced to write a few words on the above competition. I most distinctly deny that "Well Considered" is an expensive and flashily-got-up design; the elevations are careful architectural drawings very lightly tinted; the sections show the constructional details, and are tinted as working drawings. It is grossly incorrect to state that "the building is faced with Portland stone upon 150 feet of frontage, decorated in the most lavish manner, and with internal finishings in accord with the exterior." If your correspondent had only read the report which accompanied the design he could not have blundered so greatly unless wilfully blind; the Havil-street elevation is principally of brick, with stone heads, sills, and strings; the quaius, rusticated piers, and other portions of the Vestry-Hall elevations in Havil-street and Peckham-road are also proposed to be of white brick; the decoration is principally only incised work, and the interior decoration is merely stencilled ornament in quiet neutral tints.

The cubical contents of "Well Considered" are considerably below your correspondent's figures, therefore his very high fancy estimate is excessively beyond the mark. The accommodation required by the instructions has only been given, and the heights of floors strictly adhered to, consequently I am certain that in the respect of cubic contents and cost, it will bear favourable comparison with any design submitted.

"One of the Unfortunate Sixteen," upon a mere rumour has no right to charge the members of the vestry with a desire to act unfairly, so as to give work to friends. I can truly say that the author of "Well Considered" is not a Camberwell practitioner, and is also totally unacquainted with any member of the vestry. I certainly think it was a mistake not to have exhibited all the designs, and to have had unbiassed professional assistance in the selection, so that at least a little of the discreditable

squabbling which at every competition takes place amongst the competitors, might, perhaps, in the present instance have been avoided.—I am, &c., X. Y. Z.

VILLA RESIDENCE, CAMBORNE.

SIR,—Permit me to state in reply to the inquiries of a correspondent in last week's paper that the cost of the Villa Residence, Camborne, was correctly stated in the remarks accompanying the illustration on the 8th inst.—namely, that it would not exceed £1,350. I may also add that the contract amount is £1,295; the tenders followed in tolerably close order upon that amount, and the £55 allowed for contingencies is more than sufficient for that purpose. Grates and mantel-pieces, however, are not included in the contract (except fixing), for obvious reasons, and the stones were in this case unusually close at hand.

I quite agree with your correspondent "S. H." that the building is unusually cheap (even for this part of Cornwall), and the cost per cube foot is far below what you allow in your competition for house plans.

That the building might be rendered substantial without superfluous strength (and consequently superfluous cost) was in this case a no less laborious study than the design itself.—I am, &c., JAMES HICKS.

Redruth, 26th December, 1871.

PRIZE BONUS AWARDS TO ART MASTERS.

SIR,—In your last impression you insert a list, giving the names of a few only of the art masters to whom bonuses have been awarded by the Science and Art Department. Whoever has supplied you with the information has done injustice to those whose names have been omitted. I enclose a correct list, and I trust that in fairness to all you will kindly insert it in full, that the relative positions taken by the successful schools may be seen at a glance.

In accordance with the principles laid down by the minute of the 19th of February, 1861, and having regard to the number of students taught in each school, the following prizes have been awarded by the Lords of the Committee of Council on Education:—

John Parker, S. Martin's, London.....	50
Louisa Gann, Bloomsbury.....	40
J. S. Rawls, F.S.A., Nottingham.....	40
W. J. Mueckley, Manchester (Royal Institution).....	40
Charles D. Hodder, Edinburgh.....	30
George Stewart, West London.....	30
D. W. Rainbach, Birmingham.....	30
J. P. Frazer, Salisbury.....	30
W. H. Sounes, Sheffield.....	30
Robert Greenleach, Glasgow.....	20
John Sparkes, Lambeth.....	20
W. H. Stoford, Halifax.....	20
W. C. Way, Newcastle-on-Tyne.....	20
A. A. Bradbury, Hanley.....	20
Walter Smith, Bradford.....	20
S. F. Mills, S. Thomas's, Charterhouse.....	20
Walter Smith, Leeds.....	20
John Menzies, Aberdeen.....	20
R. C. Puckett, Ph. D., Leeds Mechanics' Institution.....	20
John Anderson, Coventry.....	10
T. C. Simmonds, Derby.....	10
J. P. Bacon, Stoke-upon-Trent.....	10
Herbert Lees, Carlisle.....	10
John Kemp, Stroud.....	10
Edwin Lyne, Dublin (Royal Society).....	10
D. Smith, Saltaire.....	10
E. R. Taylor, Lincoln.....	10
John Bentley, Birkenhead.....	10
J. S. Goepel, Frome.....	10
J. C. Thompson, Warrington.....	10
S. A. Ashworth, Edinburgh (Female).....	10
Wilmut Pilsbury, Leicester.....	10
W. C. Way, Sunderland.....	10
T. M. Lindsay, Belfast.....	10
W. Stewart, Paisley.....	10
H. N. Geoffri, Penzance.....	10
C. Swinstead, North London.....	10
A. Stevenson, Keighley.....	10
John N. Smith, Bristol.....	10

—I am, &c.,

FAIR PLAY.

CHURCH BUILDING.

SIR,—As a specimen of the way in which our profession is served, I would call your attention to the following advertisement, which I have just read in a weekly religious journal having a large circulation:—

"CHURCH ARCHITECTURE.—A congregation about to build will be glad to hear of a church already erected, within 40 miles of Liverpool, in which the arrangements for acoustics, style, school-room, &c., are combined to the best advantage, as a model for a church to accommodate about 500; the whole cost, exclusive of land, not to exceed £3,000.—Address, William Davies, 15, and 17, Berry-street, Liverpool."

Are the architects of the respective neighbouring churches expected to reply and give a puff for themselves? I sincerely hope that the advertiser—who is not ashamed of his name and address—will fail in the accomplishment of so mean an action.—I am, &c., H. W. P.

London, 27th December, 1871.

[Is the above advertisement so unreasonably after all? According to modern architectural criticism, most of modern buildings, both lay and ecclesiastical,

are unfitted for their respective purposes. See, for instance, Mr. Fergusson's observations on "Modern Architecture" in another column. If there is so much bad architecture about, and many of our principal architects say there is, it is not surprising that a congregation about to build a church should make inquiries, so that they may know what to avoid as well as what to imitate.—Ed.]

BRICKWORK.

SIR,—In reference to your article on brickwork in your issue of the 15th, I would be glad to be informed if the bottom or any course of the footings to walls, &c., was ever found to be broken, and if so, what the building was used for. Answer to this will oblige. You will further oblige by calling attention to the dump course on the ground line that it may be inserted in the new Building Act. I have read from time to time of accidents to servants getting out of windows to clean them; a simple remedy would be to make it compulsory on builders to double-hang all the sashes, then there would be no necessity to get outside, neither would it add much to the expense, say, 2s. per window. The convenience would be much greater, allowing the top sash to be pulled down for ventilation. If Parliament will look to these matters, with the letter-box you noticed last week, I feel sure they will confer a boon on the public.—I am, &c., THOMAS BAKER.

123, Summer-road, Peckham, S.E.

Intercommunication.

QUESTIONS.

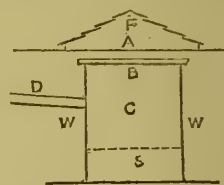
[2409.]—**Architectural Library.**—Could any correspondent of the BUILDING NEWS inform me of a library or museum in London or other large town containing architectural books which I could obtain the use of as at another library, I paying carriage into the country?—STUDENT.

[2410.]—**Rule for Workman.**—By what rule can a workman strike a straight line across a board as a guide to saw a straight, true cross-cut?—J. M. E.

[2411.]—**Lay Dilapidations.**—I should be glad if the writer of the articles on this subject would, by way of practical illustration, answer the following queries:—(1.) If, at the end of a lease where tenant covenants to repair a boarded floor is to all appearance sound and in a tenable state of repair, but when taking up a board the underside of the boards and joists are found to be rotten, must the lessee replace, although possibly, if undisturbed, the floor might last a few years, and without taking up a board the real state of the floor would not be known? (2.) Suppose a roof to be framed of English timber, say fir, put on during the term of a lease by the tenant, the tile or slate-covering perfectly sound, but the timber thoroughly worm-eaten, although not at the time giving way, is the lessee bound to replace the timber?—Z.

[2412.]—**Heating Church.**—Would any brother subscriber kindly inform me of the cheapest effectual method of heating an old church containing 30,000 cubic feet, there being three small galleries? Also, what is mixed amongst china ink to make it "line" on tracing cloth?—STEWART.

[2413.]—**Cesspool.**—Will some reader offer an opinion upon the following construction of cesspool through "Intercommunication?" It will be best described by a sketch, thus:—C is the cesspool; W the walls, formed of dry masonry; S, the bottom, of loose round stones and gravel; D, the house-drain; B, an iron frame or tray, the bottom of which is of perforated zinc or fine wire gauze; A, a layer of charcoal, or some deodorising substance, 4 in. deep; F, a



movable wooden cover, formed with openlouvre boards. Would not the sewer-gas generated in the cesspool find easy exit through A B, and become deodorised in its passage, and thus the cesspool would be ventilated without polluting the atmosphere above?—M.

REPLIES.

[2407.]—**Pollard Oak** can be had of John Cross, builder, Hutton, near Brentwood, Essex.—READER OF THE BUILDING NEWS.

LEGAL INTELLIGENCE.

A FRAUDULENT DEBTOR.—Charles Martin, a builder, was recently charged at Derby, before Mr. Justice Lush, with fraudulently coaling £82, under the new Debtors' Act, 1869, section 11. The prisoner had omitted to account for £100 in the bankruptcy proceedings, and said that he had paid it away. Subsequently, £82 was discovered under some bricks in his cellar. The jury found the prisoner guilty, and he was sentenced to six months' imprisonment, with hard labour.

CLAYTON v. HIGHT.—In this case, heard last week in the City of London Court, plaintiff, a clerk of works, succeeded defendant, for whom he had been inspecting build-

ings at Norwood, for £2 2s. wages on wrongful dismissal. Mr. Francis, instructed by Mr. Nott, appeared for defendant, who, it appeared from his own evidence, was discharged for want of punctuality, and after having absented himself for some days on the plea of ill-health; he had undertaken other business for a Mr. Fletcher while engaged for plaintiff. The sum paid to him as wages was as computation for the time he had been at the works in the last fortnight prior to his discharge.—Non-suited.

BANKRUPTCY.—IN RE T. QUINN.—In this case the debtor has filed a petition for liquidation, estimating his debts at £10,000. He is a merchant of Great St. Helen's, and also carries on the business of a builder at Forst-hill and Addlestone. This was an application to dissolve an injunction. The Sheriff of Surrey had seized the furniture at the instance of a creditor, but had been restrained, and it was now alleged that, under a bill of sale, it had become the property of Michael Quinn, a brother of the debtor, and the application to dissolve the interim injunction was made on the ground that the Court had no jurisdiction. Mr. Registrar Roche decided that as there was a possibility that it might turn out that a former act of bankruptcy had been committed, he should continue the injunction till after the appointment of a trustee.

THE MARSEILLES EXTENSION RAILWAY AND LAND COMPANY.—The Lords Justices on Friday week heard an appeal from a decision of Vice-Chancellor Malins, in which the learned judge disallowed an application on the part of the official liquidator of the Credit Foncier and Mobilier to be admitted to prove for a sum of £10,000 in the winding-up of the Marseilles Extension Railway and Land Company. Their lordships reversed the judgment of the Vice-Chancellor, and allowed the claim.

WATER SUPPLY AND SANITARY MATTERS.

CASTLEFORD.—The necessary works, &c., for the supply of Castleford with water are to be commenced, and when once put in hand will be prosecuted vigorously.

THE SANITARY STATE OF PONTEFRACT.—A meeting of the Sanitary Committee of the Pontefract Corporation was held on Friday last, and a deputation attended from the adjoining township of Tanshelf, in consequence of a notice having been served upon the overseers to cease to use the drains of Pontefract for sewage purposes. The Mayor informed the deputation that unless the notice were complied with, compulsory measures would be taken. It was, he said, almost certain that in the next Parliament the town would be compelled to carry out a thorough system of drainage, and he thought Tanshelf would be savers by amalgamating with the borough. The deputation (Messrs. Hounsfield and Swift) strongly objected to any amalgamation, and said it was the bad drainage of Pontefract which polluted that of Tanshelf. The township, however, would be glad to unite with Pontefract in some arrangement to effect a complete system of drainage for the two townships.

THE SEWAGE AT KING'S CROSS.—On Friday last a deputation of the ratepayers of the parishes of S. Pancras, Clerkenwell, and S. Mary's, Islington, waited upon the Board of Works, and presented a memorial, setting forth the particulars of a nuisance under which the neighbourhood suffered from the overflow of the Fleet sewer. The memorialists set forth that their houses were rendered uninhabitable and devoid of use in consequence of the foul smell engendered by the overflow. Low fevers, diphtheria, and other diseases arising from the insanitary condition resulting from the overflow have prevailed in houses tenanted by about 1,000 people. They trusted that the board would alter and construct their drainage so as to remove the evils complained of. Dr. Poplam, on behalf of the deputation, said the houses were reeking with infection, disease in consequence was prevalent, causing many deaths, and if the matter was not seen to and the overflow stopped, the neighbourhood would become the focus of infection, spreading disease and death all over the metropolis. Mr. Healy moved that the memorial should be referred to the Works Committee. Mr. Savage hoped the board would investigate it at once. The motion was carried.

THE NEW SEWERAGE WORKS IN BISHOPSGATE-STREET.—The construction of the large new sewer down Bishopsgate-street, Gracechurch-street, and King William-street, which has been rendered necessary in consequence of the metropolitan extension of the Great Eastern Railway Company passing under Bishopsgate-street and intercepting the existing sewer, is rapidly proceeding, about two-thirds of the entire length of sewer, which is 1,450 yards long, having already been completed. The sewer is considerably below the existing sewer and the level of the railway at the point where it intersects Bishopsgate-street, its average depth from the last-named street to Gracechurch-street, where it falls into the present main sewer, being from 35ft. to 40ft. from the street level. In order to carry out the works fifteen shafts have been sunk, and the sewer is being constructed between these

two shafts by means of tunnelling. The dimensions of the sewer, which is egg-shaped, are very large, being 5ft. 8in. in height, and 4ft. wide. Messrs. Mowlem, Burt, & Freeman are the contractors. This portion of the works will involve the company in an expenditure of between £25,000 and £30,000. The portion of the extension line of railway from Edmonton to Commercial-street, Shoreditch, by the side of the present Great Eastern terminus, is, it may here be stated, nearly completed, and is expected to be opened in the spring of the new year. The works between Bishopsgate-street and Liverpool-street, where the new station will be erected, are also actively in progress, including the necessary excavations for the station. The level of the line at Liverpool-street station will be 16ft. below the street level, being considerably lower than the North London line adjoining.

Our Office Table.

THE COST OF GOING TO LAW.—The *Stamford Mercury* reports an instance of the foolishness of going to law about trifles. The Vestry of Whittlesey quarrelled with the Isle of Ely authorities as to which should repair Briggate Bridge. The Whittlesey Vestry resolved to go to law, and the result is that, after six years' argument, the case has come to nothing. There is, however, £1,500 to pay, for half of which it seems that the twenty-seven parishioners who attended the Whittlesey Vestry are personally liable. It seems that the outlay of a few shillings would have repaired the actual damage to the bridge, and a few pounds would have put it into good repair.

MR. RUSKIN AND THE PROPOSED RESTORATION OF WARWICK CASTLE.—Mr. Ruskin writes to the *Daily Telegraph* to express his surprise at the advocacy by that journal of the scheme for rebuilding Warwick Castle by public subscription. Mr. Ruskin says he is a castle lover of the truest sort, but he adds, "I am at this hour endeavouring to find work and food for a boy of seventeen, one of eight people—two married couples, a woman and her daughter, and this boy and his sister—who all sleep together in a room some 18ft. square, in the heart of London; and you call upon me for a subscription to rebuild Warwick Castle." Mr. Ruskin's name will therefore not be found in the list of subscribers to the Warwick fund.

CLASS OF CONSTRUCTION, ARCHITECTURAL ASSOCIATION.—The next meeting of this class will take place on Friday evening next, January 5th, when the subject will be "Ventilation and Lighting." The following are the questions to be worked out by the members:—1. Explain the necessity and first principles of ventilation. What are the general means of obtaining it? 2. How do you account for the down draught frequently proceeding from large glass surfaces? What would you do to remedy it? 3. Give plan showing the position of beds, windows, &c., &c., in a hospital ward, stating the reasons that have led you to adopt it? How would you warm and ventilate? 4. What means are adopted for intensifying direct light when the quantity is insufficient, as in narrow courts, &c., &c. 5. What is the best mode of lighting a picture gallery, both naturally and artificially? 6. Give methods of combining ventilation with artificial lighting. 7. State roughly the proportion required between the lighting surface and contents of an apartment.

THE THAMES EMBANKMENT.—At the last meeting of the Metropolitan Board of Works a report was presented from the Works Committee recommending that the carriage-way of the Victoria Embankment and its approaches be metalled with broken granite, and that the unfinished portions of the footways at the eastern end of the Temple be permanently paved with York stone, with the exception of the portion of the north side footway which will be affected by the intended improvement of the approach from Chatham-place, and the part of the south side footway upon which the Board have allowed Mr. Armani to lay down a specimen of his asphalt. Mr. Runtz, in moving the adoption of the report, said the cost of asphalt for the entire roadway would be £47,000, which the committee thought would be too great an expense to go to, as they were not sufficiently acquainted with the qualities of asphalt to warrant them in laying out so great a sum. The cost of block granite would be about £36,000, but to pave it with broken granite and have it rolled by a steam roller would cost scarcely a third of the sum. The report was adopted.

THE FOUNDATIONS OF THE NEW LAW COURTS.—The foundations for the new courts of law, which have been in progress during the last twelve months,

by Messrs. Dove Brothers, the contractors for this preliminary portion of the work, are now almost completed. The foundations for the large Central Hall are entirely finished, the whole of the concrete bed having been laid, as also are the foundations for the courts on the east and west sides of the hall, the whole being prepared and now ready to receive the superstructure, which might now be commenced at once, provided the plans were ready and the contract entered into; and it is now confidently understood that this will not be much longer deferred. The only remaining portion of the work now to be done connected with Messrs. Dove's contract is the eastern foundation near Temple-bar for the offices and other buildings connected with the intended structure, and the concrete bottom is already to a large extent laid at the south-east-angle, the excavations at the other portions being in progress. The retaining wall at the extreme north area of the ground, 500ft. in length, has also been built. It is of great strength and thickness, varying from 8ft. to 5ft. in width, and is 25ft. in height from the base to the top of the parapet. The wall is constructed in what may be called Gothic arcading, there being about 80 arches within its entire length. During the progress of the works 140,000 cubic feet of earth-work have been removed; and it is perhaps worthy of remark that although the site is associated with many historical recollections, nothing of the slightest interest, antiquarian or otherwise, has been found, the only article of value being a large and profitable bed of gravel. The time for the completion of the foundations is February next, and it is expected that they will be finished shortly after that period.

CHIPS.

Mr. James Leslie, C.E., Edinburgh, has been appointed Engineer to the Edinburgh Water Trust, at a salary of £300 per annum, and it has been determined to appoint an assistant engineer, at a salary of £250 per annum.

We understand that the tender of Mr. Bridge, of Burscough and Ormskirk, has been accepted for the new stations at Lytham and Kirkham. The contract price is about £12,000.

The North Bridge at Edinburgh is to be altered and widened at a cost not to exceed £10,000.

At its sitting on the 9th inst., the Académie des Beaux-Arts, Paris, elected M. Questel, architect, a titular member of the Section of Architecture, in place of the late M. Duban.

At a meeting of the Royal Academy held on Wednesday week, Messrs. Dobson and Lumb Stocks were elected full members of the body.

The Wellingborough School Board has requested Mr. Edwin Sharman to lay before the board plans and estimates for two proposed schools, such plans to be sent in free of expense to the board if not approved.

The Society of Civil Engineers of Paris on the 15th inst. made its new elections. M. Muller will be President for 1872; he is a professor of the Central School, architect of the workmen's town at Mulhouse, manager of the Ivory Chemical Works, and is well known by many large works of construction.

In the *Polytechnisches Journal von Dingler* for October, Dr. Dingler states that wood impregnated with a strong solution of common salt resists decay, and answers well for underground work in mines and coal-pits.

The resignation of Mr. Ellier, Clerk to the Surveyor to the Camberwell Vestry, has been accepted.

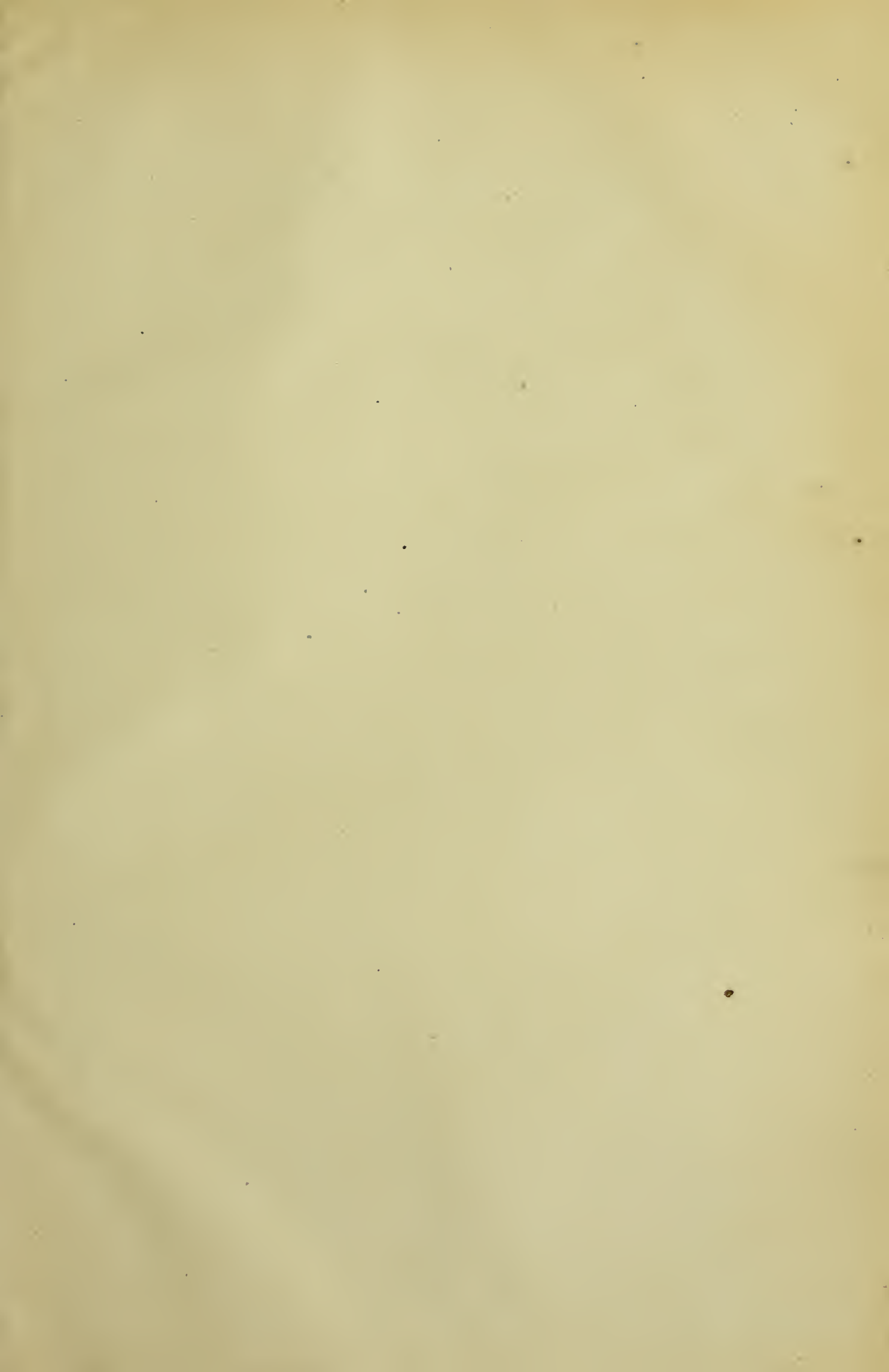
The surveyor to the S. Olave's (Southwark) Board of Works is engaged in preparing a scheme for improving the communication between Mill Lane and Tooley-street.

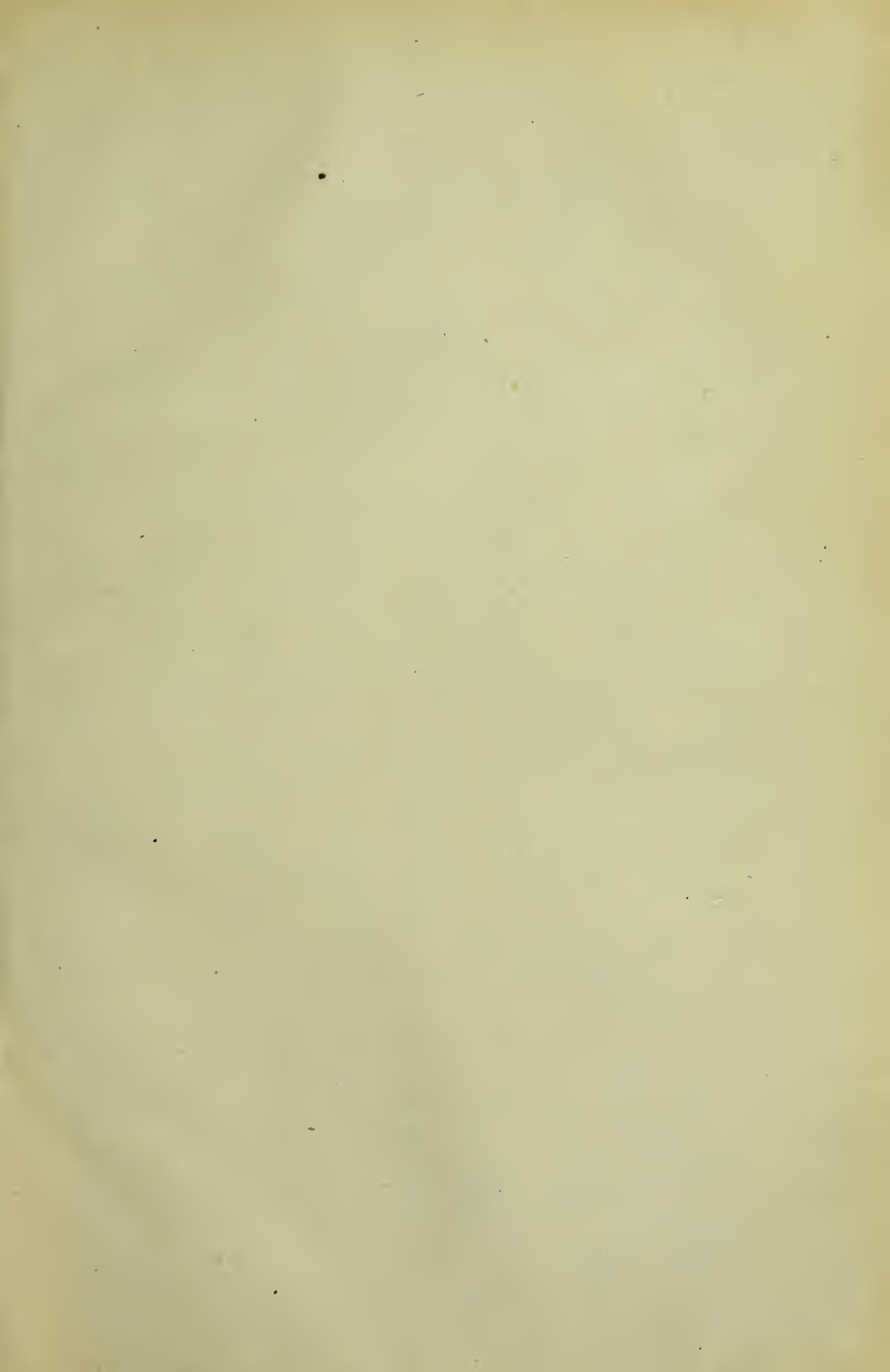
The Bermondsey Vestry has refused to consent to allow the South Eastern Railway Company to construct a bridge over the line of rails running under the S. James's-road, as they consider the gradient proposed (1 in 25) is too steep. The Vestry has resolved to oppose any gradient less than 1 in 30.

The Corporation of London are contemplating the erection of one or two large blocks of dwellings for artisans on some of the vacant land in the neighbourhood of the Holborn Viaduct. The need for such erections, great as it now is in the neighbourhood, will be still greater when the new central railway station on the Holborn Viaduct is built.

VICTORIA (BIRMINGHAM) LAND AND BUILDING SOCIETY.—The official liquidator (Mr. C. A. Harrison) has paid the second and final dividend, consisting of 3s. 9d. in the pound, to the members of this society. The payments on the first dividend of 5s. in the pound, which was declared on the 23rd of June, 1870, amounted to £7,888 2s. 8d. The total claims amounted to £31,400. The final dividend of 3s. 9d. in the pound amounts to £5,916, and of this sum £3,865 has been paid to 310 of the creditors.

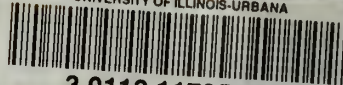
BREAKFAST—EPPS'S COCOA.—GRATEFUL AND COMFORT
ing.—"By a thorough knowledge of the natural laws
which govern the operations of digestion and nutrition
and by a careful application of the fine properties of well
selected cocoa, Mr. Epps has provided our breakfast
tables with a delicately flavoured beverage which may
save us many heavy doctors' bills."—Civil Service
Gazette. "I made up my mind to try Wm. E. Epps's Milk
Chocolate. The packet is labelled—JAMES EPPS & CO., Homoeo-
pathic Chemists, London." Also, makers of Epps's Milky
Cocoa (Cocoa and Condensed Milk).







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